AIR CONDITIONING HEATING & REFRIGERATION NEWS

The Newspaper of the Industry

RESIDENTIAL — COMMERCIAL — INDUSTRIAL

March 30, 1959

Issued every Monday at 470 West Fort St., Detroit 26, Michigan. Established 1926

Member, Associated Business Publications ABP ABC Member, Audit Bureau of Circulations

Trade Mark Registered U.S. Patent Office. Copyright 1959, by Business News Publishing Co.

Subscription Price, $6 Per Year (U. S. and Canada). Foreign: $10.00 Per Year.

Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Stories of the Week
Quote of the Week
Cape Cadaveral?
The Oblique Sell
Blind Can Read Money
Freedom Some Day?
Watch These Students!
'Coolers' Send Mercury Soaring In Humid Congo

Stories of the Week

"How's your son making out in the Army?"

"Wonderful. Already he is an AWOL, and now they're going to make him a court martial."

"What church do you go to, little boy?"

"I'm a seventh-day absentist."

Quote of the Week

One ought to do some foolish things in youth; they are what make you feel young and spirited when you think about them in your quieter old age.— LIN YUTANG.

Cape Cadaveral?

As world population zooms ever upward, space grows crowdeder and crowdeder. Some day people (our grandchildren, possibly) may have to hold somebody on their shoulders 24 hours a day.

Cemeteries will be a real problem. They'll get bigger and bigger while we need land more and more.

It has been suggested that, instead of burial, dead bodies be placed inside missiles and rocketed into Outer Space.

Sure. The launching pad: Cape Cadaveral.

The Oblique Sell

From our friends at the National Institute of Locker and Freezer Provisioners comes this interesting sales idea:

"Someone told us recently about a new twist in selling with which he is experimenting, and which we think is worthy of consideration, at least, by members of this industry."

Our friend calls his new approach "Walkaway Selling." Basic idea is to turn on your heel *at just the right time* when meeting with sales resistance.

By turning on your heel we mean stop crowding the prospect, let some steam blow out the safety valve, switch into an almost disinterested soft sell approach (this must be done tactfully) when the prospect is apparently crawling into a shell.

(Concluded on Page 8, Col. 1)

'Most Happy Fellas'

Mfrs. Report Record Orders

DETROIT—"Most happy fella" these days is the air conditioning manufacturer. He is watching the orders pour in and equipment roll away from his shipping docks at record rates.

Fedders Corp. reports that it set a new record for air conditioner shipments during the first six months of its 1959 fiscal year. The previous high in 1958 was topped by 18%, says E. M. Becker, sales manager.

"Sales by our wholesale distributors to appliance retailers are running at a pace even greater than our factory shipments," he beamed.

Chrysler Airtemp had the greenest St. Patrick's Day in its history with a "Million Dollar Sell-A-Thon" producing $3,587,000 in orders for air conditioning and heating equipment.

As reported elsewhere in this issue, York Div. of Borg-Warner Corp., burgeoning with orders, has put its Decatur, Ill. plant on two-shift, six-day week operations.

Coolerator Div. of McGraw-Edison Co. reports room air conditioners moving out at double last year's rate. Gibson Refrigerator Co. tells the same story with February and March shipments 106% ahead of last year.

Arkla Air Conditioning Corp. scored its best month ever in February, shipping 931 gas air conditioners and chillers as compared with 834 in January and 492 in February, 1958.

Frozen Food Code Would Require 0° F.

CHICAGO—A standard zero temperature for frozen food products through every stage from the packer through retail sale would be required by state laws under a set of "tentative standards" proposed by state food and drug officials and the frozen food packing industry.

The zero temperature requirement and other parts of the code were unveiled at the National Association of Frozen Food Packers' annual meeting.

C. S. Brinsfield, chief of the Div. of Food Control for the Maryland State Dept. of Health and chairman of the committees drafting the proposed code, said his committee is "at least a year off from finishing it."

'Watchdogs' Upgrading Dallas Jobs

Year-Old Cooling Inspection Plan Sponsored by ACRA

DALLAS — The "watchdog committee" program, established in April of 1958 by the Air Conditioning & Refrigeration Contractors Association of Dallas to help insure, through an inspection procedure, the quality and safety of air conditioning installations, has helped to upgrade the general quality of such installations, ACRA officials believe.

While the committee ostensibly was set up to assure the buying public of the quality as well as the safety of installations sold by association members, there has been a general improvement in installations generally because of the high standards set by the association program.

The Dallas contractors' association is now giving some thought to the possibility of promoting this upgrading program to builders and buyers of air conditioned establishments in a more intensive manner, possibly along the lines of the "Silver Shield" program which the National Warm Air Heating & Air Conditioning Association is sponsoring for heating contractors.

Such a program could involve the certification and labeling of installations which have been designed and installed

(Concluded on Page 23, Col. 1)

G-E Air Conditioning Outlines Product, Promotion Plans

TYLER, Texas — With the consolidation of manufacturing facilities for central unit air conditioning equipment at its plant here, General Electric Co.'s air conditioning department will push the marketing of its air-cooled air conditioning and heat pump equipment with several special promotional programs, states C. B. Ramsdell, the department's marketing manager.

Spearheading the promotion plans is a key area newspaper, TV, and radio campaign designed to develop new sales prospects for G-E dealers. This effort is supplemented by other local advertising and sales promotion assistants.

Models currently being produced at Tyler include air-cooled self-contained and split system air conditioners from 1-ton through 5-tons' capacity and "Weathertron" heat pumps in the 2-ton through 5-ton range, for residential and light commercial applications.

Development work continues on expanding the present line to keep abreast of future requirements. Gas and oil-fired residential heating equipment is

(Concluded on Page 21, Col. 4)

BEHIND PAGE ONE . . .

RESIDENTIAL Air Conditioning News 7
INDUSTRIAL Air Conditioning News 9
- **Determining Leaving Dry-Bulb Temp.** 10
- **Technical Center**
  Refrigerant Charging Procedures (4) 16
- **Fundamentals of Air Moving Systems**
  (1) How System Works 18
- **Refrigeration Problems**
  Thermometer In Service Work 19
- **What's New** 14
- **World Trade News** 6

20 Million Electrically Heated Homes by '79 Described as Goal

CHICAGO—Setting a goal of 20 million homes to be electrically heated by 1979, Paul W. Emler, vice president of American Electric Power Service Corp., outlined in a recent speech how that goal can be attained.

The utility official spoke during Edison Electric Institute's 25th annual sales conference at the Edgewater Beach hotel here.

Emler first listed important reasons why electric utilities should be promoting electric heating.

One reason, he said, is that electric heating can bring about substantial residential load growth. In illustrating this growth story "with a few figures taken from our own experience," he made this comparison:

"1958 was not a record-setting year for [American Electric Power System] companies. [AEPS operates in Virginia, West Virginia, Kentucky, Tennessee, Ohio, Indiana, and Michigan.]

"The recession was reflected in fewer new houses built in the area, an industrial slowdown with a resulting reduction in payroll dollars and a small decrease in major electrical appliance sales.

"As a result of this, our total

(Concluded on Page 21, Col. 1)

Bendix-Westinghouse Names Frank Haag

ELYRIA, Ohio—Appointment of Frank A. Haag as general manager of the Evansville Div. of Bendix-Westinghouse Automotive Air Brake Co. was announced by W. B. Paine, president.

F. A. Haag

Haag joined Bendix - Westinghouse in Elyria in 1956 and has been manager of industrial products.

In his new assignment at Evansville, Ind. he assumes complete responsibility for the operation of the company's division engaged in the manufacture of motor-compressors and condensing units for the refrigeration and air conditioning industry.

In announcing Haag's appointment, Paine said, "In the

(Concluded on Page 4, Col. 5)

Detroit BHCB Finds 26 'Unsafe' Heating Jobs

DETROIT—First report by a field inspection team of the Better Heating & Cooling Bureau here reveals that 26 heating installations in one builder's new home project are unsafe.

The Better Heating & Cooling Bureau is a relatively new organization of heating contractors in the Detroit area who are determined to do something to clean up the industry.

One phase of the bureau's activity is to check into homeowner complaints and to inspect new installations to see if they meet code requirements.

George Asher, executive secretary of the bureau, noted that the unsafe conditions in this case have been called to the attention of the builder, the heating contractor, city inspectors, and the Federal Housing Administration.

Remedial action has been promised, Asher noted, and the bureau intends to follow up to see that it is carried out. "There will be no passing the buck," he affirmed.

Excerpts from the inspection report revealed this condition:

"A gas-fired furnace has been installed in a small inside room

(Concluded on Page 4, Col. 1)

86, No. 13, Serial No. 1,566

Reentered as second class matter October 3, 1936, at the post office at Detroit, Mich., under the Act of March 3, 1879.

Arkla Purchases Gas Heating Equipment Line from Kalamazoo Firm

LITTLE ROCK, Ark.—Arkla Air Conditioning Corp. announced that it has purchased outright the Humphrey line of gas heating equipment manufactured by General Gas Light Co. at Kalamazoo, Mich.

Manufacture of the gas heaters and furnaces bearing the Humphrey name will be transferred to the Arkla plant at Evansville, and will be continued and expanded in the appliance division of Arkla, according to W. R. Stephens, Arkla president.

The transaction, Stephens said, included the name, goodwill, patents, tools, dies, fixtures, and inventory of the Humphrey line. Purchase price was not announced.

Arkla has acquired a sufficient inventory of products in the transaction, Stephens said, to enable it to make shipments to dealers and distributors without interruption during the transfer of manufacturing operations. Production is expected to get under way at Evansville by June 15.

The Humphrey distribution system of utilities, dealers, and manufacturer's representatives will be retained, Stephens said, and sales headquarters will be established with those of the other Arkla industries at 812 Main St., Little Rock.

Arkla will continue to manufacture the complete lines of Humphrey room circulators, suspended unit heaters, duct furnaces, and residential central heating equipment.

Detroit Controls Holds First National Sales Meeting In Detroit

DETROIT—The first national sales meeting ever held by the Detroit Controls Div. of American-Standard was attended by more than 80 key executives and salesmen at the Fort Shelby hotel on Tuesday and Wednesday, March 24-25.

John R. Warnock, general manager of marketing for the division, said that the meeting pointed up the new business philosophy of the management team which has assumed leadership during the past five months. Stressed were aggressive salesmanship, better service, and creation of new markets.

"Service and growth are the watchwords of our division," Warnock added.

Signs of the (GOOD) Times

York Orders Lead to 2-Shift, 6-Day Week

YORK, Pa. — The Decatur (Ill.) Works of the York Div. of Borg-Warner Corp. went on a two-shift, six-day-week operation on March 16, according to Henry M. Haase, York president.

This new work schedule will remain in effect "until further notice," Haase said, and has been made necessary by the record backlog of orders for the company's room air conditioning units, most of which are produced at Decatur.

"Orders for York packaged products, including air conditioners, are running considerably ahead of last year," he stated. "Independent distributors alone accounted for approximately $3,000,000 in business during the first three weeks in February. This is an increase in packaged product orders of 65% over the same period of 1958."

Included in York's packaged products are such units as room and central air conditioners, packaged heat pumps, furnaces, and ice making equipment.

* * *

Coolerator Shipments Doubling 1958 Rate

ALBION, Mich.—W. G. Kronauge, vice president in charge of sales for Coolerator Div. of McGraw-Edison Co., announced that shipments on 1959 air conditioners were more than double those for the comparable period of 1958.

The announcement said that the division "ended the 1958 season with practically no inventory after having increased Coolerator volume in a year when the industry as a whole was off in sales.

"The acceptance of the 1959 room air conditioning line has exceeded the fondest expectations of Coolerator Div. management and it is expected that total 1959 product shipments will be the highest in Coolerator Div. history."

* * *

Shipments at Gibson 84% Ahead of Last Year

GREENVILLE, Mich. — Announcing that shipments of Gibson Refrigerator Co.'s 1959 major appliance models have been 84% ahead of last year in February and March. President Charles J. Gibson, Jr. said room air conditioner shipments were running 106% ahead of last year, biggest gain in the line.

He also reported that the company's order backlog on the line will keep the production operation on two hours overtime for at least two and a half months.

* * *

Arkla-Servel Reports Best Month In History

EVANSVILLE, Ind. — Shipments of Arkla-Servel "All-Year" gas air conditioning units for February exceeded any previous month in the history of the company, according to W. R. Stephens, president of Arkla Air Conditioning Corp.

A total of 931 units were shipped from the Evansville factory of Arkla during February, compared to the highest previous month's shipment of 834 units, and compared to a total of 492 units shipped in February, 1958, Stephens said.

The totals include the 3½ and 5-ton Arkla-Servel "Sun Valleys" for year-round heating and cooling of homes and smaller commercial buildings, and 25-ton Arkla-Servel chillers for commercial and industrial applications.

Shipments for the first two months of 1959 totaled 1,595 units, compared to 949 units for the first two months of 1958, Stephens said.

THROW YOUR COMPRESSOR *OUT!

*OUTSIDE, THAT IS!

KRAMER'S outdoor compressor is the *only* compressor designed to operate *outdoors* for *any* application under *all* temperatures and weather conditions.

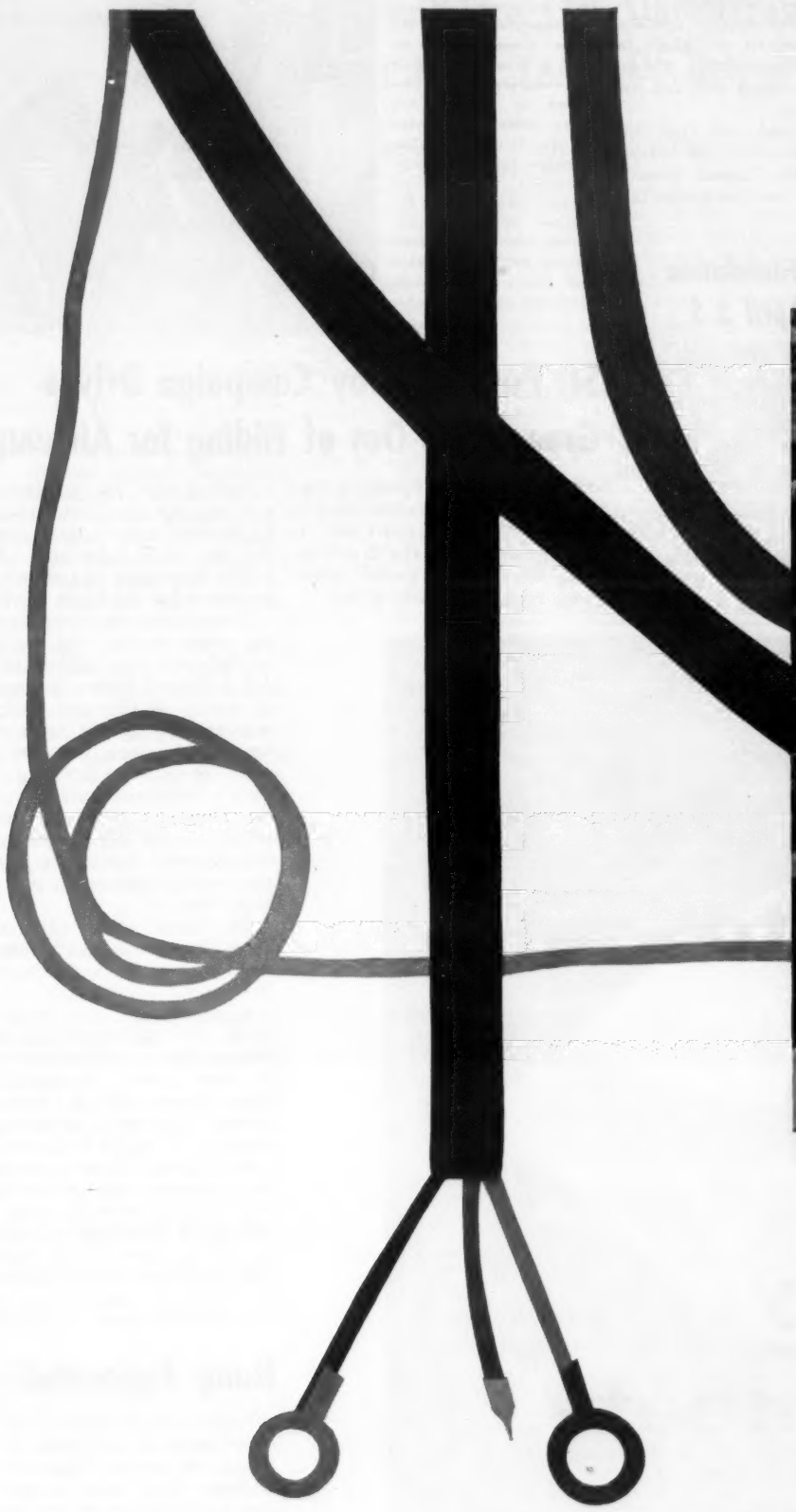
Completely assembled, wired, tested and factory run-in, it arrives on the job ready to operate. Simple hookup eliminates costly installation and control adjustment time. Kramer's outdoor compressor ends waste of valuable indoor space.

WRITE FOR BULLETIN

KRAMER OUTDOOR COMPRESSOR

KRAMER TRENTON CO. • Trenton 5, N. J.

46 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER



The technician shown here is putting a condensing unit through the low-voltage test to make sure it will start and keep running satisfactorily even with a 10% drop-off in the specified voltage. Four additional such tests assure top performance of every Bendix-Westinghouse condensing unit.

WHY BENDIX-WESTINGHOUSE JOB-TAILORED TESTING CUTS LINE REJECTS AS MUCH AS 75%

Exclusive Bendix-Westinghouse test program licks line reject problem on condensing units

There are two ways to test a commercial refrigeration compressor or condensing unit before shipping it to a customer.

One is to plug it in until it "turns over". Time required: *a few seconds.* Information gained about the product's "performability": *practically none.*

The other way—the Bendix-Westinghouse way—is to run the units for sustained periods of time under simulated operating conditions, checking all phases of their operation. During our exclusive five-point test program we check suction pressure and head pressure, low-voltage operation, performance efficiency and other important operating factors. If there is sub-par performance anywhere along the line, that unit isn't shipped. Time required: *at least 30 minutes each.* "Performability" information gained: *plenty!*

Because *only Bendix-Westinghouse* takes the time and trouble to provide the "product insurance" offered by the second method, Bendix-Westinghouse compressors and condensing units have by far the best record in cutting line rejects—by 75% in some instances. Recently, a freezer manufacturer told us he felt our thorough testing program had enabled him to practically eliminate his long-time problem with rejects.

We think this kind of product dependability is well worth the extra trouble—and expense to us—that this exclusive "run-in" testing requires. Your order will enable us to prove it to your satisfaction, too.

Bendix-Westinghouse

EVANSVILLE, INDIANA

A division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio. Export Sales: Bendix International, 205 E. 42nd Street, New York 17, New York.

Detroit BHCB--

(Concluded from Page 1, Col. 4)

with access from an inside hall through two louvered doors. A gas-fired water heater has also been installed in the same room and connected to the same chimney flue.

"The warm air ducts have been installed in the attic space with stacks dropping to low wall or baseboard registers located on inside partitions.

"The return air system consists of a 24 by 15-in. filter and filter housing not connected to a return air duct, but depending solely upon the return air from the entire structure entering the furnace through the louvered doors.

"This furnace is rated at 100,000 B.t.u.h. input with a blower capacity of 840 c.f.m. under a suction pressure of 0.05. Since there is no duct work connected to it, there would be no pressure exterior to the furnace and, undoubtedly, the blower would handle in excess of the rated capacity and could cause a negative pressure in the furnace room, resulting in a down draft and removing through gases, or in the case of flame failure, raw gas.

"This is a dangerous condition and must be corrected immediately. This builder proposes to close the existing return air openings to the furnace and install a 24 by 16-in. grille in the wall facing the family room. This would be a violation of FHA MPR 1004-6.4 which reads:

" 'Return air inlets shall be of sufficient number and so located that return air from any room will not pass across the normally occupied areas of another room in such manner as to cause objectionable draft. The c.f.m. capacity of warm air inlets and ducts shall be not less than the designed c.f.m. capacity of the supply system. Grilles for return air shall be sized so that velocity of air through free areas will not exceed 500 f.p.m.' "

Asher pointed out that the builder has removed the louvered doors from homes already occupied to avert the immediate gas danger.

Research Foundation To Meet April 2-5

COLORADO SPRINGS, Colo. —Annual meeting of The Refrigeration Research Foundation will be held April 2-5 at the Statler Hilton and Sheraton Carlton hotels in Washington, D. C.

Scientific Advisory Council meetings are set for April 2 and 3, the foundation membership meeting April 4, and Executive Committee meeting April 5.

TWO leprechauns (in real life, performers for the Shrine Circus), were on hand to greet the 30 field sales representatives who arrived at Chrysler Airtemp's offices in Dayton for the St. Patrick's Day telephone sales campaign. The smiles were as bright at day's end, too, as the salesmen took $3,587,000 in orders for air conditioning and heating equipment from the firm's wholesale distributors across the country.

St. Patrick's Day Campaign Drives Greenbacks Out of Hiding for Airtemp

DAYTON—St. Patrick's Day 1959 will be long remembered by Airtemp Div., Chrysler Corp., as the "greenest" in the firm's 25-years—and the green didn't come from shamrocks alone.

Orders for air conditioning and heating equipment totaling $3,587,000 were taken during the day. The sales also added 12,024 man-days of factory employment for the firm's workers.

Occasioning the record-breaking order session was the first St. Patrick's Day "Million Dollar Sell-A-Thon," during the course of which 30 Chrysler Airtemp regional and district sales managers made more than 500 personal telephone calls to the company's wholesale outlets across the country. They originally hoped to sell $1,000,000 worth of equipment during the day—a goal reached before the day was half over.

By day's end, enthusiasm, sales know-how, and durable speaking voice had exceeded that quota by 350%.

J. B. Ogden, vice president-sales, singled out three sales leaders for special mention: R. B. Stotz, general manager, Applied Machinery & Systems, whose department exceeded its quota by 242%; P. B. Lockwood, Los Angeles district manager for packaged air conditioning and heating products, who exceeded his individual sales quota by 533%; and T. B. Sexton, Los Angeles district manager for room air conditioners, who exceeded his quota by 371%.

Haag Appointed--

(Concluded from Page 1, Col. 5)

short span of two and a half years, we believe Bendix-Westinghouse has made a substantial contribution to the industry.

"We have stimulated a market through aggressive product development and sales activities, initiated broad new engineering programs, and increased sales 50% each year. We are confident that the Evansville Div., under Haag's direction, will continue this pace of progress in the future."

Prior to joining Bendix-Westinghouse, Haag was associated with the refrigeration and air conditioning industry for nearly 20 years.

He held such posts as eastern district manager for Fedders, general sales manager of Tranter Mfg., manager of the refrigeration division of Salem Engineering Co., and sales manager of commercial products for Jack & Heintz Co.

At Evansville, Haag succeeds John R. Morrill who resigned to accept the presidency of a Chicago manufacturer of equipment for the electrical utility industry.

The bright, clean, uniform color of H & H tubing, the burr-free ends tells of quality you can *see*. But today scientific instruments like the Magnaflux unit pictured at the left, watch for tubing imperfections the human eye *can't* see. So if you want tubing that's free of all inclusions, laminations, laps and slivers, tubing that's free of any wavy conditions inside or out, it will pay you to always remember you can *depend* on H & H.

H&H TUBE AND MANUFACTURING CO.

271 N. Forman Avenue, Detroit 17, Michigan • Offices from Coast to Coast

METALFLO LOCKSEAM COIL STRIP SEAMLESS TUBING TUBULAR PARTS

Aluminum, Stainless Steel Use Up Wisconsin Sheet Metal Assn. Told

MILWAUKEE — Increasing use of aluminum in many applications, including ductwork, means that "those of you who aren't too well acquainted with aluminum would be wise to become so," the Sheet Metal Contractors Association of Wisconsin was told at its 44th annual convention here.

In a "what's cookin' " session on non-ferrous metals and stainless steels contractors heard James H. Blayden, Aluminum Co. of America; Ed Finn and others of Chase Brass & Copper Co. discuss copper, especially the current price situation, and Joseph Vial, vice president of Chicago Steel Service, declared that government stockpiling of defense items having been completed, stainless steel will be available in much greater quantities now.

Aluminum is now being used at the rate of over 2 million tons a year in thousands of different applications, Blayden said, adding that the amount used in ductwork is expected to double this year.

Numerous favorable properties of aluminum were cited, including its light weight, resistance to corrosion, conductivity of heat and electricity, reflectivity, etc.

While only one-third as rigid as galvanized iron, the same rigidity can be achieved by using a 40% thicker gauge or changing the design, such as providing flanges, Blayden indicated.

As for the problem of soldering aluminum, Blayden asserted that it's "actually very easy if the right flux and solder are used."

Big problem, he said, is selecting a solder and flux that won't cause corrosion in the presence of moisture.

In using lead-coated copper sheet, contractors were advised by a Chase representative that it has to be handled carefully to avoid scratching the lead and exposing the copper. When the copper is exposed to the atmosphere, corrosion will take place rapidly, it was emphasized.

Similar precautions must be used in soldering lead-clad copper. A paste should be employed as the flux and a non-acid type solder used. Care must also be taken when soldering to make sure that the lead doesn't melt and expose the copper.

Out-of-Town Contractors Believed To Be Using Addresses Of Detroit Telephone Answering Service To Get Licenses

By George M. Hanning

HIGHLAND PARK, Mich. — A check-up is now being made by the city of Detroit officials to uncover out-of-town refrigeration and heating contractors who are using telephone answering services in Detroit as the address of their principal place of business in order to qualify for a city contractor's license.

This was revealed to the Reciprocal Refrigeration Council meeting here recently by Frank Drogosch, chief safety engineer for the city.

The check-up was sparked by uncovering one such case and by the opinion of the city counsel that a telephone answering service is not a legal address. The offending contractor has been summoned to show cause why his license should not be revoked, Drogosch also revealed in his talk.

To participate in the reciprocal program, a contractor must take out his license in the community in which he has his principal place of business, it was further noted.

The Reciprocal Refrigeration Council, an organization to promote reciprocal licensing of refrigeration contractors by communities in the Detroit area, took the following actions at its March meeting:

Invited representatives of the room air conditioning industry to air their complaints about the window air conditioner provisions of the council's recommended code at the council's April meeting at 2 p.m. April 15 in the Highland Park city council chambers.

Established a committee to draw up a uniform set of procedures for use by all licensing examining boards in all reciprocal communities.

Approved a general information bulletin for communities desiring to become associated with the council.

Approved a motion requiring a community desiring to join the council to amend their heating ordinance to provide for a restricted heating license as a balance for the provision of a restricted refrigeration license in the refrigeration code.

Bell & Gossett Reports Earnings of $312,556 For First Quarter

MORTON GROVE, Ill.—Bell & Gossett Co. reported net earnings of $312,556 for the first three months ended Feb. 28, 1959 of the current fiscal year.

Earnings were equivalent to 19 cents per share on the 1,572,944 shares of common stock outstanding.

This compares with net earnings of $209,081, or 13 cents per share, reported for the first three months a year ago.

According to R. E. Moore, president, net sales of the company for the first quarter of 1959 were $6,180,922, a 19% increase over the first three months of fiscal 1958 when net sales totalled $5,182,302.

Moore predicted another record, or near-record, year for the company for the remainder of the 1959 fiscal year, and reported that the company's backlog of orders is the highest it has been in the past ten years.

SEND FOR REPRINTS

"ELECTRICAL CHARACTERISTICS OF PACKAGED AIR CONDITIONING UNITS."

Only 25¢ each.

For your copy, clip this ad and mail with name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

WHETHER POWERED BY GAS OR ELECTRIC

Specify

EFFICIENT, POSITIVE ACTION

ALCO

REFRIGERANT CONTROLS

1 ALCO P.O. VALVES—designed and engineered specifically for wide load applications—particularly recommended for refrigeration systems having compressor capacity reduction.

2 ALCO'S PILOT OPERATED THERMO® EXPANSION VALVES give a positive control to 15% of nominal capacity with minimum superheat.

3 ALCO SOLENOID PILOT STOP VALVE insures positive liquid "Shut off".

Use and specify ALCO—the one complete line of REFRIGERANT CONTROLS...engineered for efficient trouble free performance.

7988

• *BUY SECURITY*
• *BUY QUALITY*
• *BUY ALCO*

ALCO VALVE CO.
853 KINGSLAND AVE. • ST. LOUIS 5, MO.

The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors Solenoid Valves • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

PRESIDENT George Romney of American Motors (center, left) and President Gino Gastaldi of Necchi, (center, right) study cutaway model of a Kelvinator-designed compressor, which Necchi will produce under license in Italy. E. H. Wilcox (left), Kelvinator export vice-president, and B. A. Chapman (right), executive vice president and general manager of AM's appliance division, concluded the agreement with Necchi in Detroit.

To Make Compressors

Kelvinator Licenses Necchi In Italy

DETROIT — A licensing agreement for the manufacture of Kelvinator refrigeration compressors in Italy has been concluded between the Necchi Co. of Pavia, Italy, and Kelvinator International.

This was announced by B. A. Chapman, executive vice president and general manager of the Kelvinator appliance division of American Motors Corp.

Chapman said Necchi becomes the 16th foreign licensee in Kelvinator's expanding international operations, and the second to be licensed in Italy. Kelvinator refrigerators already are being manufactured by the S. A. F. E. T. Co. of Milan.

Necchi will produce compressors for a "tremendous potential market" that not only includes S. A. F. E. T. but also other refrigeration equipment producers, Chapman said.

The largest producer of sewing machines in Italy, the Necchi works at Pavia includes its own foundries and die-casting plant, which make it readily adaptable to compressor production, the announcement noted. Total employment is currently 4,500 people.

New Firm To Produce Whirlpool Lines for Brazilian Market

ST. JOSEPH, Mich. — Whirlpool Corp. announced its participation in the formation of Multibras-Industria de Aparelhos Domesticos Ltda., a Brazilian appliance manufacturer.

In this new concern Whirlpool will be associated with Companhia Industrial E. Commercial Brasmotor, a Brazilian manufacturing and distributing company. Brasmotor will operate the new company and Whirlpool will provide technical assistance.

The new company will manufacture a line of appliances designed by Whirlpool for sales in Brazil through Sears, Roebuck & Co. and Brasmotor. Initially, "Coldspot" refrigerators for sales through Sears stores in Brazil and Brastemp refrigerators for sales through independent outlets will be manufactured. A full line of air conditioners and washers will follow.

German Service Books Now Being Published

KARLSRUHE, W. Germany —The first five of 20 intended booklets for training "refrigerationists in assembling and servicing" has been published here by C. F. Mueller Publishing Co.

Subject matter of the first five: math, physics, technique of refrigeration, electrical theory, cold storage of foodstuffs. Each booklet contains about 40 pages, and the entire series will serve as both a course and reference work.

Sweden Freezer President Serves On Calcutta, India Trade Mission

SEATTLE—The U.S. Government's Bureau of Foreign Commerce named Harvey F. Swenson, president of Sweden Freezer Mfg. Co. here, as a member of the U. S. Trade Mission to Calcutta, India, from Feb. 14 to April 18.

Headed by a Bureau of Foreign Commerce official, the team was scheduled to tour principal cities in the Calcutta area and will consult and advise with local businessmen and Government officials, individually and in groups, on American methods of doing business, application of U. S. production techniques, and development of specific trade and investment opportunities.

After completing its tour, the mission will occupy offices at the Trade Information Center of the U. S. Exhibit in Calcutta to which additional Indian businessmen will be invited.

The Mission to Calcutta is the second in a series of four in connection with U. S. exhibits in India over a two-year span, according to the Bureau of Foreign Commerce.

Swenson's experience in building Sweden Freezer Mfg. Co. from a one-man shop to a worldwide organization with production facilities in Seattle, Columbus, Ohio, Holland, Australia, and proposed facilities in Japan, it was noted, is considered excellent background for the theme of the U. S. Exhibit: "The Place of Small Private Enterprise in a Developing Economy."

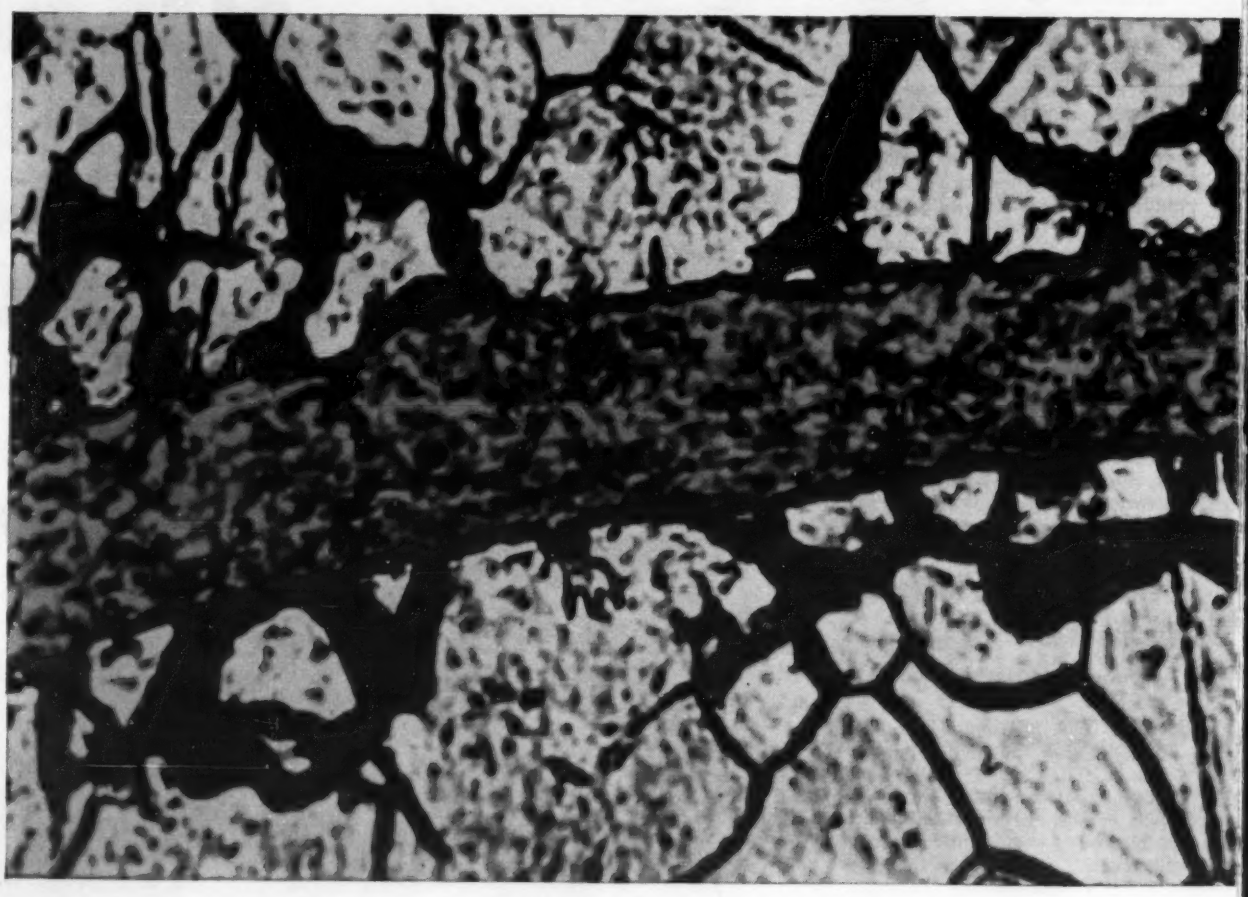
Refrigeration Education Seen World-Wide Need By International Group

PARIS, France — Projecting 50 years of past accomplishment into the future, the International Institute of Refrigeration sees education as one of its major activities for the future.

Correspondence or full-time courses, developed by international professors for countries where no courses are available, form one approach to worldwide education, according to the announcement.

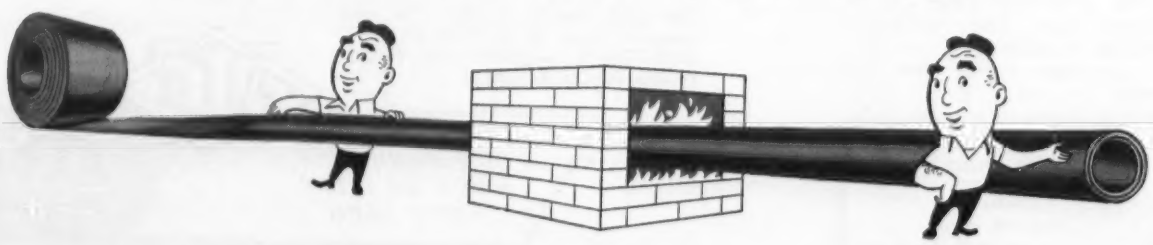
The IIR also foresees an increased student exchange program in the industry and a program to educate, with the help of international experts, teachers for countries which are less developed in refrigeration techniques.

WHY BUNDY LEADS IN MASS-FABRICATION:



COPPER BRAZING...Another reason why

And Bundyweld can be mass-fabricated even in the most complex shapes—at a low unit-cost which results from three Bundy advantages:



Bundyweld starts as a single strip of copper-coated steel. Then it's continuously rolled twice around laterally . . .

into a tube of uniform thickness, and passed through a furnace where copper coating fuses with basic steel.

Result: Bundyweld Tubing—double-walled, beadless, metallurgically bonded through 360° of wall contact.

Carrier Introduces Home 'Climate Center'

NEW YORK CITY—A "Climate Center" for the home was introduced by Carrier Corp. at a press preview here.

The new product is in production and will be marketed immediately by the Carrier distribution and dealer organizations.

The device enables the owner of an air conditioned home to monitor outside weather, control indoor temperatures, and regulate the operation of heating and cooling equipment, all from a single location in the main living area, it was explained.

"Designed for wall-mounting, the 8 by 14-in. satin chrome instrument panel gives constant readings of outdoor and indoor temperatures, barometric pressure and relative humidity; controls both heating and cooling cycles; provides for automatic fan operation and for pre-set adjustments of temperatures during nighttime and daytime hours," the announcement said further.

CLIMATE CENTER by Carrier Corp. monitors outdoor weather, indoor conditions and regulates the operation of a year-round air conditioning system. The three black dials set into the satin chrome panel are: an electric timer for automatic temperature adjustment, a barometer, an indoor thermometer and a hygrometer for measuring humidity. The vertical thermometer indicates outdoor temperature, while the three switches on the upper left control both heating and cooling, fan operation and automatic nighttime temperature setback. The center dial is for temperature adjustment, while the opaque square houses four signal lights that warn if the filter is clogged, the gas pilot goes out, the oil burner fails to ignite, or if any one of a number of other checks must be made.

"It also flashes warning lights if the filter is clogged, the pilot light goes out, the oil burner fails to ignite, the compressor starts to act up, or the condensate drain is plugged," it was noted.

Russell Gray, Carrier vice president and general manager of the Unitary Equipment Div., predicted that the Climate Center would be a strong influence in the growth of year-round air conditioning "because it provides new elements of convenience, efficiency, and economy."

The Carrier executive said the new control unit also answers the air conditioning industry's need for a visible and attractive symbol of the benefits of year-round residential air conditioning.

NWAHACA Expands Staff To Render Better Service

CLEVELAND—An expansion of its activities to provide better service for dealer-contractors, wholesalers, manufacturers, and consumers was announced by the National Warm Air Heating & Air Conditioning Association.

J. G. Baker

J. D. Nolan

Richard von Munkwitz

According to George Boeddener, managing director, the following steps are being taken in accordance with policy decision approved by the association's Board of Trustees:

1. Addition of a second engineer to the technical department to expand revision of manuals and to conduct additional analysis of technical information from the association's research projects at the University of Illinois.

2. Addition of a field representative to the public relations staff responsible for the organization of local Indoor Comfort Bureaus in conjunction with expansion of the "Silver Shield" program to cities throughout the nation.

3. Realignment of public relations responsibilities with a shift of consumer and dealer bulletin publications and news releases to a third new man who came to the association as a replacement in August of last year.

Assigned to assist the technical director is John "Gary" Baker, a mechanical engineer with 25 years' experience in the heating and air conditioning industry. Baker was graduated from Purdue university and did graduate work at Northeastern university, Boston and Case Institute of Technology.

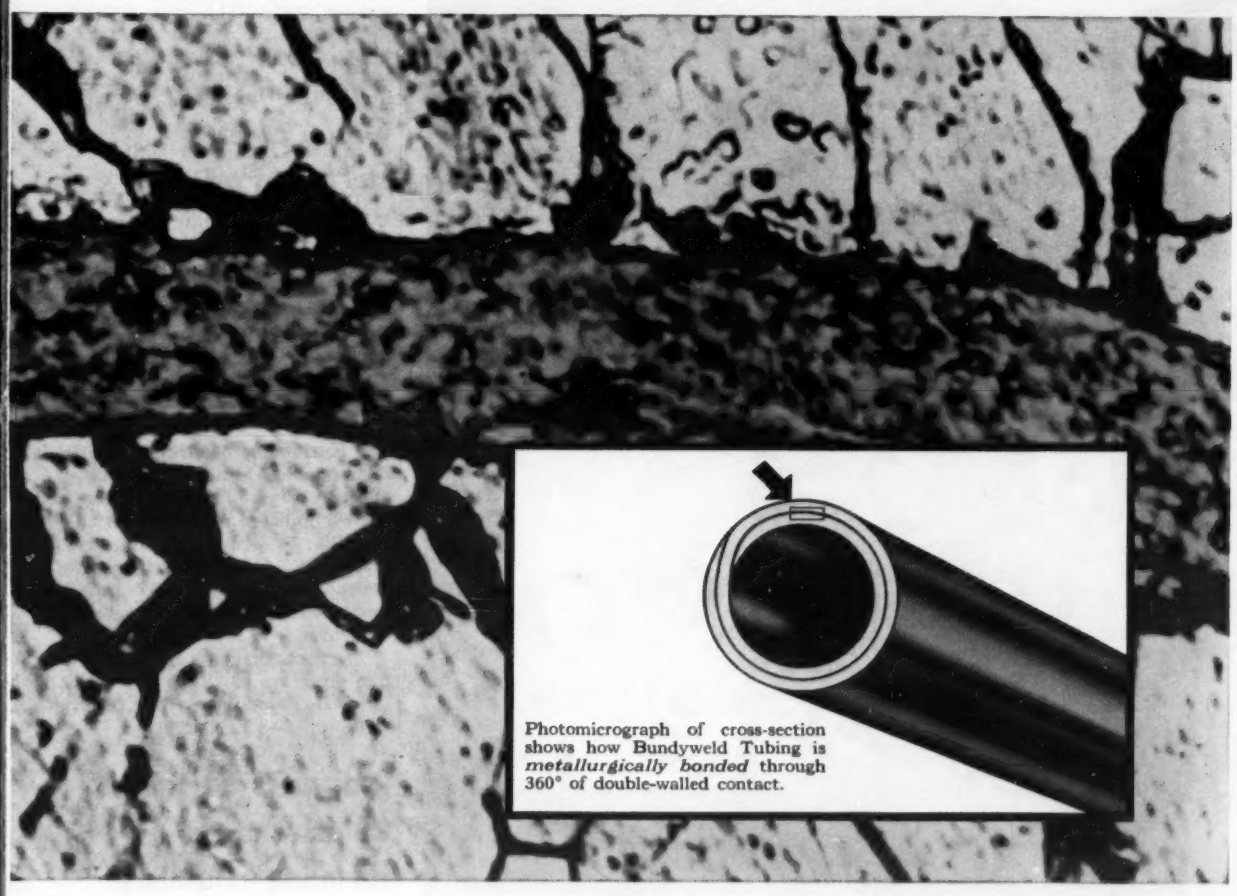
Prior to joining the association, he was manager of application engineering of Viking Air Products, Cleveland.

New field representative in the public relations department is Richard von Munkwitz, who joins the association with a background of 10 years' newspaper experience.

Von Munkwitz was the "key" advertising account representative for the *Milwaukee Journal* on heating, air conditioning, building material products, association promotion, and new home construction.

The third new face in national headquarters of the association is James D. Nolan, an industrial engineer by profession, who has joined the public relations department.

Nolan, with a background of engineering and writing, joined the association after a special engineering project with Iron Fireman Mfg. Co. of Cleveland.


Photomicrograph of cross-section shows how Bundyweld Tubing is *metallurgically bonded* through 360° of double-walled contact.

Bundyweld prevents refrigerant leakage

This tubing was passed through a furnace where its copper coating *fused* permanently with base steel. It's just one of three reasons why Bundy® leads in the modern art of mass-fabrication.

Bundyweld Tubing® is copper-brazed to remain *leakproof by test*. Halogen detectors sensitive to leaks as small as 1/100 ounce a year can find no fault in Bundyweld. No wonder it's the standard of the industry for condensers and evaporators, compressor parts and refrigerant lines.

Free design service is yours at Bundy. Engineers famous for solving tricky tubing problems will work with you at any stage in the creation of a product; help you get parts at lowest unit cost.

Expert fabrication service is another Bundy specialty. From 80-ft. serpentines to tiny capillaries, skilled technicians will turn out parts to your specifications; deliver them on time, ready to use.

Find out how it pays to check *first* with Bundy on any tubing problem. Call, write or wire us today!

BUNDY TUBING COMPANY • DETROIT 14, MICHIGAN

WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING • AFFILIATED PLANTS IN AUSTRALIA, ENGLAND, FRANCE, GERMANY, AND ITALY

There's no real substitute for

BUNDYWELD® TUBING

Bundyweld and Bundy specialty tubings are sold through distributors in principal cities

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

"For example: Your prospect is interested in a bulk freezer food order. However, after you explain the details to her, she decides that she wants to talk it over with her husband who is out of town for two weeks, check prices at the butcher shop and supermarket, pay off her furniture first, and try to float a loan from her Aunt Sadie so she doesn't have to finance the food.

"You try to meet all of her objections but with each word you utter she becomes more 'unsold.'" According to the Walkaway Selling theory, it's now time to walk away (figuratively) from her before you scare her into never coming back.

"Just back off a little; don't lose interest, but drop your anxiety. Sympathize a little with her reasons for objecting, and give her the impression that you think she's intelligent for weighing things so thoroughly.

"Convey the feeling, without saying it, that if she doesn't buy this, someone else will. Be friendly and courteous and, without becoming snooty and haughty, create the impression that this sale isn't so all fired important to you anyhow."

According to the theory she'll either change her mind and buy now, come back next week and buy, or walk out and never come back like she intended to do in the first place.

Our friend who's been trying this approach seems to think it's excellent. He's still in business—in fact, big business—so we recommend that you cautiously give the plan a try.

Blind Can Read Money

Some weeks ago "Dope" wrote about a blind lad he met in Colorado. This fellow had extraordinary hearing, and staggering extra-sensory perception.

Comes now Jimmy Pooler with a tale told him by a cab driver.

"Of all the afflictions I wouldn't want," the cabbie said, "it is to be blind. But a funny thing just happened. You see that blind man going in the hospital?"

"Well he gave me a bill after I drove him over here," the cabbie went on.

"I looked at it and said to him, 'Did you know you gave me a five-dollar bill?' And the blind man said that, of course, he knew it was a five.

"So I said to him, 'You mean you can tell how much a bill is by just feeling it?'

"And the blind fellow said he could.

"So I took out a bill and handed it to him. And he ran his fingers over it and said, 'That's a ten spot.'

"And that's just what it was. How do they do it?"

Freedom Some Day? Watch These Students!

Vassily Leontief, Russian-born Harvard economist, returned recently from a tour of the Soviet Union, where he had been invited to give a series of university lectures.

After one question-and-answer session, a group of students asked him why he chose to live in a capitalist country. Why didn't he return to his homeland and help build the socialist state?

"I'll be glad to answer that," said Dr. Leontief. "After living 20 years in a free country, I wouldn't care to live anywhere else."

Somewhat to his surprise, the Russian students spontaneously burst into what the Communists —when describing response to Khrushchev's speeches — call "Stormy, Prolonged Applause."

'Coolers' Send Mercury Soaring In Humid Congo

An Italian manufacturer got his orders crossed, and the three air conditioners sent to Stanleyville in the Belgian Congo to keep star Audrey Hepburn cool in her apartment and dressing room turned out to be humidifiers.

They arrived on a day when the Congo humidity was 100%. Miss Hepburn was in Stanleyville for Warners' production of "The Nun's Story."

She says the humidifiers would be just dandy in the Sahara, the Gobi, or Palm Springs.

Michigan Heating Group Elects DeHaan President

DETROIT—John DeHaan of Kalamazoo was elected president of the Michigan Heating & Sheet Metal Association during the group's 48th annual convention held here recently.

DeHaan served as president of the group several years ago.

A. W. Keats of Detroit is the newly-elected vice president, and Earle Oole of Grand Rapids is treasurer. J. Biddle continues as secretary.

New officers elected by the "auxiliary" group of suppliers include R. H. Pettinger, president; Jack Carmen, vice president; and Ed. Behm, secretary-treasurer.

The contractors also elected five directors: J. Sloan, N. Nakkula, L. Schaafsma, C. R. Martelle, and W. B. Calverley.

Redisco To Be Name Of Kelvinator's Financing Subsidiary

DETROIT — Refrigeration Discount Corp., Inc., sales financing subsidiary of Kelvinator, officially changed its name to Redisco on March 30, the company's 33rd anniversary, according to C. R. Brogan, president.

He pointed out that the company is currently referred to as "Redisco" in both the appliance and financing fields.

"The objective of Refrigeration Discount Corp. when it was founded in 1926 was to help appliance dealers make refrigerator sales," he noted. "However, Redisco has broadened its activities.

"Today, our financing services help dealers to make sales of all home appliances and furnishings. We also finance sales of Kelvinator commercial products, including ice cream cabinets and refrigerated vending machines. Redisco does not have the limitations of the original name," Brogan said.

BEFORE YOU BUY, THINK:

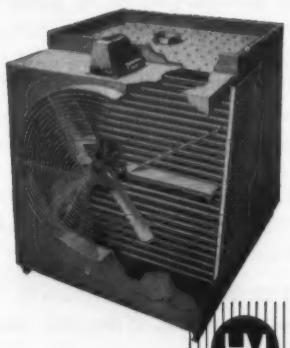
Will fungus attack your cooling tower 2 years from now?

Not if it's a Halstead & Mitchell cooling tower with a 20-Year Guarantee

The specially treated wood decking in H&M towers resists rotting, fungus attack and algae which accumulates and obstructs air flow in most other towers. Performance remains "like new" in H&M cooling towers year after year.

Only Halstead & Mitchell offers a 20-Year Guarantee on the wetted deck against failure due to rotting or fungus attack.

Other H&M features for unusually low maintenance include permanently sealed fan bearings, and a heavy gauge steel cabinet protected against corrosion by three plastic coats applied *after assembly*. Be sure. Ask your local wholesaler for H & M towers, or write to Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.



H & M COOLING TOWER WITH PRESSURE TREATED DECKING

HM Halstead & Mitchell

Water-Cooled Condensers · Cooling Towers · Air-Cooled Condensers · Finned Coil Products

Missile Tracking Ship In South Seas Outfitted with 11 Cooling Systems

BALTIMORE—Air conditioning is a vital feature of a mobile missile research station for the 5,000-mile Atlantic Test Range from Cape Canaveral, Fla.

En route to take up its lonely vigil in the South Atlantic, far off regular shipping lanes, was the *S. S. American Mariner,* a veritable floating laboratory of electronic equipment.

The refitted cargo vessel carries the latest instruments for providing the greatest variety of most precise data yet obtained on missiles fired by the U. S. military services.

Eleven air conditioning systems remove the great quantities of heat generated by electronic equipment for radar, and optical apparatus. Nine of them make living and working conditions habitable for 52 technical personnel as well as the ship's crew.

Of the total of 285 tons provided by four reciprocating refrigeration machines, two of the systems use 55 tons to cool electronic equipment directly.

Charles V. Fenn, vice president of Carrier Corp. which furnished the air conditioning plants, noted that the "life and reliability of the electronic equipment is greatly enhanced by the air conditioning associated with the installation."

Information collected on experimental missile flights will supplement data currently recorded by ground stations and picket ships operated by the Air Force.

Concrete Tower Supporting Giant Radar Antenna Needs Air Conditioning

NEW YORK CITY—Air conditioning will be a feature of a five-story concrete tower that is to serve the two-fold purpose of supporting one of the nation's largest radar antennas and housing its associated electronic and utility equipment plus the operating personnel, according to a recent announcement.

Burns & Roe, Inc., local consulting engineering firm, recently completed the design of the tower.

Located at Thomasville, Ala., the tower was designed for the Surface Armament Div., Sperry Gyroscope Co., and is the first of several to be installed at various locations in the United States.

A giant radar antenna, almost as wide as a football field and weighing more than 80 tons, will be mounted on top of the structure.

Electrical distribution systems, refrigeration and air conditioning plant, boiler room, and other utilities are on the first floor.

The second floor houses the console room, machine shop, parts storage, and maintenance and testing area.

Electronic equipment is found on the third and fourth floors, the fifth floor being devoted primarily to the transmission line and accessories. The antenna drive mechanism, which includes six 100-hp. driving motors coupled through reduction gears, is located on the roof.

Only three windows are to be found in the building, one for the security guardroom, and one each for the two rest rooms, it is noted.

Continuous operation of the electronic equipment is assured by two 50-ton air conditioning units, with a third of equal rating on standby duty.

Heating of the building in the wintertime is accomplished by a very small boiler. In fact, in designing the utilities of the building, a primary concern was not in how to keep the building warm, but how to dissipate the high heat generated by the electronic equipment, according to Burns & Roe.

North Calif. Group Elects '59 Officers

OAKLAND, Calif. — First quarterly meeting of Sheet Metal Contractors Association of Northern California for the year 1959 was held recently in Sausalito at Alta Mira hotel, reports John T. Banister, representative, who is also manager of the Oakland Builders Exchange.

Nine associations of air conditioning and sheet metal contractors meet to make up the group through representation. Officers for this year are:

President, Joe Boudreau of Belmont Sheet Metal & Home Appliance Co., Belmont; vice president, Archie Lawson of Lawson Sheet Metal, North Sacramento; and secretary-treasurer, Ed H. Grogan, who is secretary-manager for Sheet Metal Contractors Association of Stockton.

Cites Conditioned Air Effect In Industry

CLEVELAND—Sponsored by the Cleveland Electric Illuminating Co., factory managers and plant maintenance engineers from the northern Ohio industrial area gathered at the handsome new Cleveland Engineering and Scientific Center March 18 to hear a discussion of the effects of air conditioning on industrial processing and employe health.

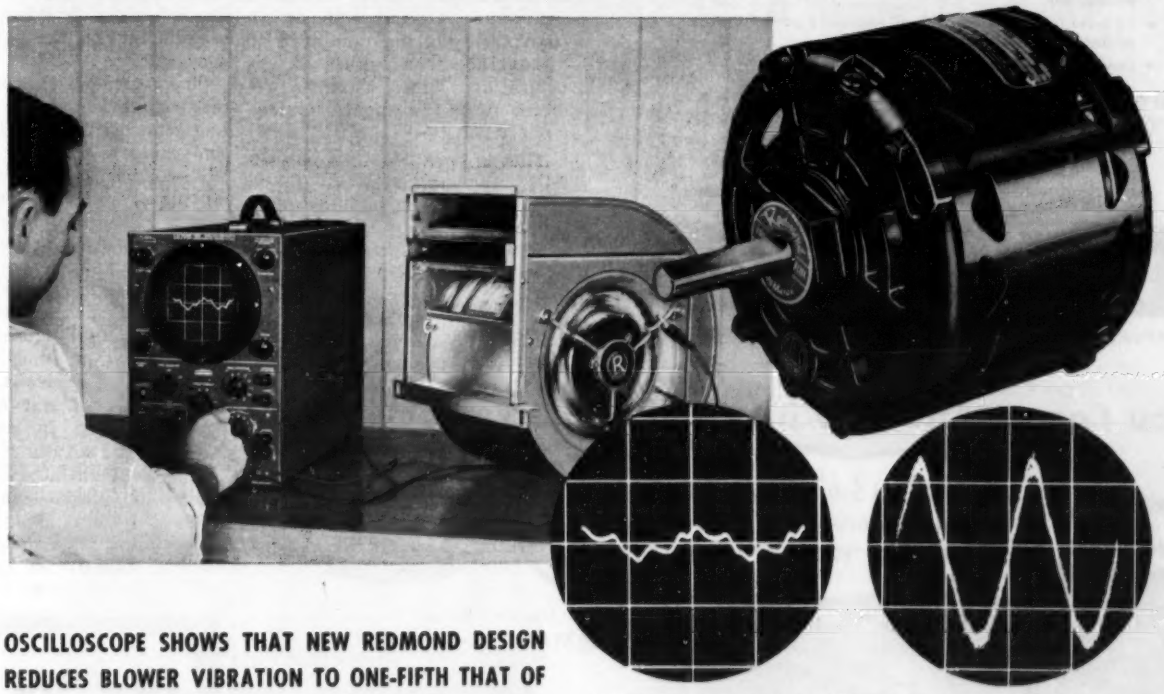
The speaker, George F. Taubeneck of AIR CONDITIONING, HEATING & REFRIGERATION NEWS, dwelt on the fact that air conditioning has many more dimensions than mere cool comfort, including the new dimension of health protection through air purification.

Olland Heads Div. Of Cleveland Firm

CLEVELAND—Warren Farr, president of Refrigeration Sales Corp., has announced the appointment of Fred F. Olland as manager of the Contract Div.

Olland will direct sales activities for this division throughout northern Ohio. He has a background of experience with refrigeration and architectural firms.

New *Redmond* Motor Is Quietest For Direct Drive Blowers



OSCILLOSCOPE SHOWS THAT NEW REDMOND DESIGN REDUCES BLOWER VIBRATION TO ONE-FIFTH THAT OF UNITS USING CONVENTIONAL SHADED-POLE MOTORS

These photographs of the oscilloscope screen show the reduction of vibration in the blower when the Redmond Type AY Micro-Motor is used. The photo at the left shows blower vibration with the Redmond AY; the one at the right shows vibration with a competitive motor.

You can see for yourself on the oscilloscope screen that the Redmond Type AY MicroMotor reduces blower vibration to only one-fifth that of competitive motors running in the blower. Whether you test with vibration testing equipment, a mechanic's stethoscope, or an oscilloscope, you will conclude that the AY is the quietest direct-drive blower motor available. Use it to solve the problem of vibration in your blowers.

The AY Tri-Flux motor is designed and manufactured in every way to give years of trouble-free service and whisper-quiet operation. The Tri-Flux design adds a third flux path, making possible a larger diameter shaded-pole motor that is more efficient and has higher starting and running torque than conventional shaded-pole motors. The positive oil system provides force-feed lubrication. Recirculating the oil assures maximum bearing life.

The new AY is ideal for a wide variety of applications requiring a quiet, economical, quality motor. Redmond sales engineers are skilled technicians whose primary function is applying a motor to your product. Contact us at Owosso, Michigan, and we will have the Redmond sales engineer in your district call you at once. See your telephone book for locations of sales offices in Cincinnati; Cleveland, Dallas; Newark; El Segundo, California; and Oak Park, Illinois.

NEW CATALOG

New 12-page catalog describes and illustrates basic line of Redmond fractional horsepower electric motors, blowers, and special products. Send request for your free copy to Redmond Company, Inc., Owosso, Michigan.

The Standard of Dependability

CC Redmond COMPANY, Inc.

Subsidiary of CONTROLS COMPANY of AMERICA

OWOSSO, MICHIGAN

THE BIG NAME IN SMALL MOTORS

Determining Leaving Dry-Bulb Temperature

A Discussion of Theoretical, Practical Factors Involved

NEW ORLEANS—The geometry of a coil and the face velocity have an almost negligible effect on the relationship of the leaving wet and dry-bulb temperatures, was the contention made in the paper "Predicting Leaving Dry-Bulb Temperatures for Air Conditioning Coils" presented by Alan S. Decker, vice president-engineering, Dunham-Bush, Inc. before the ASRE convention.

Because of this, said the author, there is an excellent chance of correlating existing and new test data to obtain an accurate method of determining the leaving dry-bulb temperature.

One of the most important problems facing the engineer designing and selecting air conditioning equipment is the determination of the condition of the air leaving a coil of given design, or selection of a coil design that will result in leaving conditions to match the load requirements, and the industry has spent a great deal of time and effort in trying to develop a satisfactory method of calculating the performance of cooling and dehumidifying coils, Decker said.

Present Practice Questioned

Methods generally in use today rely on data from tests of specific coil configurations at specific conditions to determine arbitrary constants. These constants are generally considered to hold true only for coils of the same basic design. It is this practice which Decker's paper contends is incorrect.

Methods presently in use for determining leaving conditions assume that, on a psychrometric chart, the leaving condition lies on a straight line drawn from the entering condition to the surface temperature on the saturation line—usually referred to as the apparatus dewpoint ADP.

This is true only because the ADP is an empirical point originally established by drawing lines through the entering and leaving conditions obtained in tests of geometrically similar coils.

Based on the data prepared for the paper, Decker contends that the cooling line is actually a curve, and that the intersection of a line through the entering and leaving conditions with the saturation curve bears no resemblance to the actual surface temperature.

Geometric Configuration Is Not a Factor

For a given entering condition and a given evaporating temperature, it is stated that this curve is approximately the same for all coils regardless of the geometric configuration or the face velocity.

The theories advanced in the paper were based on the results of a series of tests conducted on five different coils using controlled inlet conditions and refrigerant temperatures and measured outlet air conditions.

Results were plotted on the psychrometric chart to see if any pattern was evident. It was found, said Decker, that for any given evaporating temperature, and for the inlet air conditions used, the leaving conditions fall approximately on a smooth curve, which curve can readily be extrapolated to the inlet air condition. Extrapolation to leaving conditions below those given in the data is more difficult, because the curves are closely approximating the saturation line on the psychrometric chart.

Theoretically, the author explained, these curves will contact the saturation line at a temperature equal to the average surface temperature exposed to the air at the leaving side of the coil. Assuming constant inlet conditions and evaporating temperature, this average surface temperature will vary depending on the relative rates of heat transmission from the air to the surface, and from the surface to the refrigerant.

Existence of curves of the type described by the paper, based on the results of the tests, can be substantiated by the following theoretical thinking, said Decker:

Assuming heat removal to be effected equally on each molecule of the air water vapor mixture entering the coil, the cooling coil curve would be a straight line on the psychrometric chart, extending from the entering point horizontally to the saturation line at the entering dewpoint. At this point, if further heat removal takes place, moisture would be removed and the cooling curve would follow the saturation line.

However, in practice, it is stated, heat removal is not effected equally on each molecule, because some molecules actually contact the surface and are cooled to the surface temperature. Others are partially cooled by contacting these colder molecules, and still others probably pass through the coil without any heat removal. (It is recognized that these latter molecules can and will be cooled to the leaving temperature almost immediately after leaving the coil, by contact with colder molecules).

Moisture Removed from Air Before Dewpoint Is Reached

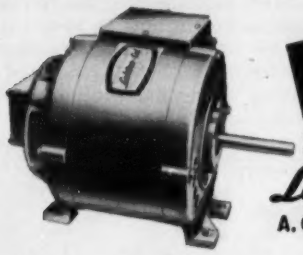
Therefore, moisture is removed from the air before the dewpoint is reached. Since the amount of sensible work done will be proportional to the difference between the dry-bulb temperature and the surface temperature, but the latent work is proportional to the difference between the dewpoint temperature and the surface temperature, it follows that initially the rate of sensible cooling is much greater than latent cooling.

As the process progresses along the cooling line, ratio of sensible to latent decreases, causing the cooling curve to dip downward.

Decker made the following points with references to the differences between the results obtained in the test data for predicting leaving temperatures, and previously published data:

If published coil data are plotted for coils with a given face area, using constant inlet conditions, constant refrigerant temperature and constant face

OVER-THE-ROAD REFRIGERATION!
Now! Convert your fleet at low cost!



NEW!
DOLE
Lektro-Cel
A. C. GENERATOR KIT

- Your present plug-in refrigeration can now be used for Over-The-Road operation.
- Power also available for heating, auxiliary lighting, pumps, etc.
- Kit furnished complete with all necessary parts for ease of installation.
- Low in cost, easily maintained.

DOLE REFRIGERATING COMPANY
5920 NORTH PULASKI ROAD, CHICAGO 46, ILLINOIS
103 PARK AVENUE, NEW YORK 17, N. Y.
In Canada: Dole Refrigerating Products Limited, Oakville, Ontario

Write for Engineering Catalog HGE

DOLE THE Cel LINE Lektro-Cel

COMPLETE REFRIGERATION SYSTEMS ALSO AVAILABLE

You Cannot Afford To Be Without This Equipment

HASTINGS HOIST-IT

THOUSANDS OF USERS
Save Money • Time • Trouble
With the "HOIST-IT" and "CLEAN-IT"

HASTINGS CLEAN-IT

Erect A 4,000 Lb. Unit In One Hour

Two Men Can Raise 4,000 lbs. up to 24 ft.
IDEAL FOR ALL TYPES OF EQUIPMENT
Air Conditioners • Heaters • Blowers
Attic Units • Transom Units

The Answer To
DE-SCALING and CLEANING
Problems

The Only Complete PORTABLE Unit On The Market

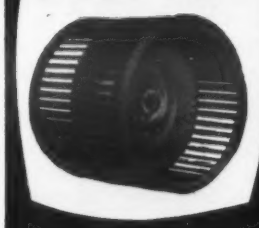
Invaluable for Cleaning
ALL TYPES OF CONDENSERS
Also
Coil Surfaces — Coil Tubes
Blower Wheels — Cooling Towers
Air Handling Units — Water Heaters

Features Include
Acid Proof Tank • Pump • Hoses
May Be Used For Pressure or Suction
Jet and Suction Nozzles
Rubber Tired Wheels

Write For Prices and Information
HOIST-IT Bulletin AC-21-H — CLEAN-IT Bulletin AC-21-C

HASTINGS AIR CONTROL Inc., OMAHA 5, NEBR.

NEW!



KRITZER
RADIANT COILS, INC.
leaders in the manufacturing of Heating and Cooling Equipment.

uses

REVCOR'S NEW DOUBLE INLET BLASTAIRE BLOWER WHEELS

because . . . Revcor's New Double Inlet Blastaire Blower Wheels' Reliability of Service Helps Kritzer to Maintain its Quality!

REVCOR SINGLE AND DOUBLE INLET BLASTAIRE BLOWER WHEELS ARE USED BY OVER 60% OF THE ROOM AIR CONDITIONER MANUFACTURERS!

Write For Technical Details

Revcor, INC. 251 EDWARDS STREET CARPENTERSVILLE, ILLINOIS

velocity, but varying rows in depth, the resulting curve will be of a similar character to the test curves.

But if published data are plotted for the same coils using a different face velocity, a completely separate curve will result. Such a variation is not borne out by the data from this series of tests.

A second point is the consistency of the results with widely varying coil designs. Two of the coils tested were of the commonly used construction of outer fins on plain tubes. The remaining three coils utilized inner fin and therefore had a much lower ratio of air side surface to refrigerant side surface than the first two coils.

In spite of this difference, Decker declared, the performance of all of the coils, with respect to the ratio of sensible to latent work was the same.

Considerable Variation Found In Curve

The authors reported that there was a considerable amount of variation in the curve with a 5° F. change in suction temperature. This was found surprising considering that no variation exists when, at a constant suction temperature, the surface temperature of one coil was as much as 6° F. higher than that of another coil.

The authors state that more work will be needed to confirm the test data and provide cooling curves for a variety of inlet conditions and refrigerant temperatures.

However, they state that it is now possible, by running a few additional tests to cover other conditions, to make use of the fact that the coil geometry has little effect on the cooling curve.

With a set of such curves it would be necessary to calculate only the leaving wet bulb by any of the existing, relatively simple methods and the curves would determine the leaving dry bulb and sensible heat ratio.

C. M. Ashley Adds Comments from Floor

C. M. Ashley, Carrier Corp. chief research engineer, made these points in a comment on the paper from the floor:

Removal of moisture from the air is accomplished faster than the removal of sensible heat, and this would affect any calculations.

There will be variations in the heat transfer affect with variations in the total load, and also from the beginning to end of the coil circuit.

Re-evaporation of moisture and by-passing of air could affect test results.

In some instances a rise in the temperature gradient may be caused by the mechanical block of the surface by water particles.

In conclusion, Decker said that the authors felt that through the development of new test data it would be possible, with a given air inlet and refrigerant temperature, to establish a definite curve of leaving temperatures.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Car Refrigerator Uses Gasoline Vapor as Refrigerant

MORGAN CITY, La.—Gasoline vapor is the refrigerant used by "Strata Freeze," a "radical new" under-the-dash refrigerator for cars, aircraft, and boats.

Production of the units—first in a line of air conditioners and refrigerators planned by the manufacturer — reached a capacity level of 480 per day in February in a plant here operated by Pol-Air, Inc.

Inventor of the device was Guy Farmer, vice president of Pol-Air and a World War II pilot, it was stated. "His successful experiments with gasoline as a refrigerant followed years of thought and observation of icing problems with aircraft engine carburetors," the announcement said.

"Farmer's refrigerator operates in this manner:

"STRATA FREEZE" refrigerator mounted under the dash of automobile.

"Gasoline is diverted from the fuel line of the automobile by a special tee fitting attached before the gasoline reaches the fuel pump.

"Most of the gasoline moves past the fitting and proceeds directly to the carburetor, but a small amount is piped towards the refrigerator and used as a coolant in the Strata Freeze coils where it expands into gaseous form.

"Pressure differential between the fuel pump intake and the point of expansion of the gasoline in the cooling coils makes the coolant fuel flow without a pump. The vacuum is taken from the intake manifold via an orifice in a special block installed between the carburetor and the manifold.

"This is capable of reducing the temperature inside the unit to near-freezing temperatures, or lower if desired, enabling the owner to cool foods, beverages, medicines, and other items quickly and safely.

"The unit is sufficiently insulated so that it retains its temperature for hours, even after the car (or boat or plane) motor is stopped. In a demonstration last year for an oil company executive, Farmer's test model refrigerator surprised viewers by producing a temperature of 20° F."

The announcement continued:

"Passing through the coils, the gaseous fuel mixes with a stream of air at reduced pressure. This air serves to absorb heat from the coils, and mixes with the gasoline vapor to provide a suitable mixture for combustion in the engine.

"Once through the coils, the mixture enters the engine via the intake manifold. It is now similar in composition to that which has been mixed in the carburetor—neither leaner nor richer. Net consumption of gasoline by the process amounts to about 2½ ozs. per hour of operation.

"The Strata Freeze refrigerator operates perfectly at slow or idling speeds, takes no power away from the engine, and places no load whatever on the electrical or cooling system of the automobile."

Tecumseh engineering VISION

offers big 3-WAY savings in a new line of

1 H.P. Pancakes

By adapting the popular Pancake shell design to room cooler application, Tecumseh can now offer the industry a line of high speed, one horsepower compressors with an appreciable reduction in physical size. The basic pancake design has already been proven on millions of household refrigerators, freezers, and many specialized applications. In addition, the AR26 pancake was installed in over 60,000 portable type room coolers this past year.

This solid background of direct field experience with this design plus the obvious cost, size and weight advantages should be of interest to every manufacturer of room coolers. With the exception of heat pump applications, the new Pancake line may be used to replace Tecumseh models S8N16, S1T16, B1516, and B1613 — and still produce comparable capacities. The savings you can realize are impressive: 8 to 10% cost reduction over the Singles, even more in comparison with the Twins; 17 to 20 pounds less weight per compressor; and between 1⅝" and 6½" advantage in corresponding dimensions! Features include a new type of 4-leg mounting, glass clip-on terminals to speed hook-up, process and suction tubes located side by side for easier production line handling. Several variations are available to accommodate top mounting where necessary.

The new AU Model Pancakes now make it possible for you to design your air conditioner with even greater "slim-line" appeal, and yet hold down cost. Contact Tecumseh about the AU Pancake line — today.

TECUMSEH 1 HP PANCAKE COMPRESSORS

MODEL AU14—7½ amp—115 v—7,050 BTU
MODEL AU1612—12 amp—115 v—10,000 BTU
MODEL AU1612—230 volt—10,000 BTU
MODEL AU1P12—230 volt—11,900 BTU
MODEL AU1P12—208 volt—11,900 BTU

1. All rating figures are nominal with acceptable limits plus or minus 5%. 2. Conditions:
130°F. condensing temperature
45°F. evaporator temperature
95°F. return gas
95°F. ambient
115°F. liquid temperature entering expansion valve
All high back pressure, r-22 models based on 300 p.s.i.g. head pressure, 77 p.s.i.g. suction pressure.

TECUMSEH

The Leader Serving Leaders in the Air Conditioning and Refrigeration Industries

TECUMSEH PRODUCTS COMPANY

MARION, OHIO — TECUMSEH, MICHIGAN

EXPORT DEPT: P. O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan
CANADA: Tecumseh Products of Canada Limited, 1667 Dundas St., London, Ontario.

They'll Do It Every Time

by Jimmy Hatlo

BIGOOME DRIVES ME NUTZ WITH THAT NERVOUS COUGH OF HIS··· I ALWAYS FEEL LIKE HITTING HIM ON THE BACK TO RELIEVE HIM····
LISTEN TO WHO'S TALKING! HE SPENDS MORE TIME CRACKIN' HIS KNUCKLES THAN CRACKIN' THE WORK BARRIER···
AND THAT COIN JINGLER-- HE SOUNDS LIKE THE INSIDE OF A ONE-ARMED BANDIT···
--AND THE TOOTH-ZSKER AND THE WHISPERING WHISTLER--HOW DID WE ACCUMULATE SUCH FOUL BALLS?
WE OUGHTA PUT THOSE SOUND EFFECTS ON TAPE AND PLAY IT BACK TO THEM···MUSIC TO GO NUTZ BY····
YEAH···AND THAT NERVOUS WAY HE TWITCHES HIS SHOULDERS··
SST-- SSSST-- SSST--
ZSK- ZSK- ZSK--
CRACKA
CRACKA
CRACKA
JINGLE
JINGLE
JINGLE
1-27
PUTTING UP WITH THE OFFICE SOUND-EFFECTS BOYS····
THANX AND HATLO'S HAT IS OFF TO JOE TAPPEN, 56 BENNINGTON ST., REVERE, MASS.
© 1959, King Features Syndicate, Inc., World rights reserved.

Automatic Merchandising Progresses Astonishingly

WHILE the United States submarine Nautilus slowly edged its way below the polar ice cap and under the North Pole, a happy ceremony (including a "North Pole cake") was staged by the crew.

Quite by routine several crew members went over to a soft drink vending machine on this historic undersea boat, and purchased soft drinks to wash down the ceremonial cake.

To find vending machines aboard the most modern of submarines is not so unusual as it might appear at first glance. The vending machine industry is playing a rapidly growing role in the daily regimen of living.

What contributes mainly to this upsurge not only is the ingenuity of vending machine entrepreneurs. Also has occurred a most happy wedding between their industry and refrigeration.

Greatest growth strides in the history of the coin machine business have come by the provision of more and more food and beverage items. This has been achieved through the use of an ever-increasing number of refrigeration compressors in the vending business.

Within a span of five years (between 1953 and 1958) the vending machine industry has advanced financially to a point which would make almost any other business envious. Five years ago the vending industry did an annual gross business of $1,365,000,000. Last year that figure increased almost a billion dollars.

Actual statistics provided by the National Automatic Merchandising Association reveals a $2,131,970,000 business in 1958.

Of this sum the greatest percentage of increase has come in machines requiring refrigeration equipment. In 1953 only $358,310,000, or a shade under 25% of total volume, accrued from devices which dispensed refrigerated items. Last year that total advanced to $976,125,000, or about 40% of the industry's gross.

"Population" of automatic merchandisers themselves paint an even more graphic picture. Five years ago the industry reported 2,769,150 slot selling devices in operation, of which only 717,650 handled items requiring refrigeration.

Last year the industry listed a "population increase" of almost a million vendors—a total of 3,716,400. Of these, 1,188,900 handled refrigerated products.

Specifically, the major leap-ahead has occurred in two categories, soft drink and milk machines. In the case of coffee machines the number has grown from 17,500 in 1953 to more than 85,000 last year.

In addition, vendors themselves have turned to fresh ground coffee and pure cream, instead of prepared concentrates. That move necessitated installation of refrigeration units (to keep the cream fresh).

In the milk field, the number of vending machines has grown from 12,000 to 53,000 in a five-year span, and all of them dispense fresh milk. Such widely varied locations as schools, army bases, and factories have embraced this convenience boon.

Alex Kramer, president of the leading milk machine company in the Detroit area (Automatic Food Products, Inc.) has this to say:

"The advances which have been made in refrigerated vending machines have been the most progressive steps in our business in years.

"Not only are milk machines in demand in many more locations but we have even pioneered with outdoor milk machines, to service the householder whose milk supply runs out at a time when normal sources are not available."

Kramer also is proud of the development of hot food vending apparatus.

"Five years ago the industry did not even list hot food machines. They were lumped together in a miscellaneous category. Nowadays there are more than 20,000 hot food vendors in operation in the United States, and that's just the beginning.

"Hot, solid food machines, which are differentiated from machines which dispense hot beverages—such as coffee, soups, hot chocolate—are the newest concept of the vending industry."

Just as automatic merchandisers have become a part of everyday living aboard the Nautilus and its counterparts, office buildings, factories, and public gathering places also have bosomed a "vending machine room"—where a variety of foods, beverages, tobaccos, etc., are handled in banks of devices carefully arranged for their merchandising appeal.

Moreover, major industrial plants have supplanted their cafeterias with such "banks" which can offer, course by course, a full meal, for all employes at lunch hours.

In all, more than a hundred items are dispensed by these devices today. Americans in total make one purchase from a vending machine every fraction of a second.

Tecumseh Products supplies the majority of the vending industry's compressor needs. Kelvinator and Bendix-Westinghouse also are suppliers.

Last year Tecumseh sold approximately 110,000 compressors to vending machine manufacturers. Al Russell, advertising manager of Tecumseh, points out that the same manufacturers also provide refrigerated storage units of the non-vending type. Hence his firm cannot establish with positive finality the number of their units which go into coin operated machines.

Russell adds, however, that the use of compressors in vending machines is growing rapidly—more so, perhaps, than the use of compressors in larger, more familiar industries.

Who knows? Next time a submarine reaches the North Pole, a vending machine may be there waiting.

Language is something more than being able to speak aloud. Language is a link between a people and their past; it is their universal means of expression in the present, much of their capacity to design for the future. Language reflects a people's character, that particular way in which they look at life and the manner in which they live it. Language reveals their individuality and identity. Whether one's own or another's, language is valuable. Unlike the gold in Fort Knox, it must be not only treasured but must be kept shining and in circulation. — CAROL DENISON.

AN INTERNATIONAL INSTITUTION • SUBSCRIBERS ALL OVER THE WORLD

Trade Mark reg. U.S. Pat. Office; Est. 1936

AIR CONDITIONING HEATING & REFRIGERATION NEWS

Copyright 1959, Business News Publishing Co.

F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

Published Every Monday by BUSINESS NEWS PUBLISHING CO., 450 W. Fort St., Detroit 26, Mich. Telephone Woodward 2-0924. Subscription Rates: U. S. and Possessions and Canada: $6.00 per year; 2 years, $9.00; 3 years, $12.00. All other countries: $10 per year. Single copy price, 40 cents. Ten or more copies, 30 cents; 50 or more copies, 20 cents each. Send remittance with order.

EDITOR & PUBLISHER, George F. Taubeneck
EDITORIAL DIRECTOR, Phil B. Redeker
ASSOCIATE EDITOR, C. Dale Mericle
ASSISTANT EDITORS: John Sweet, Hugh Mahar, George Hanning
TECHNICAL EDITOR, Frank Versagi
STATISTICAL EDITOR, John MacLean

GEN. MGR., Warren Jones
GEN. PROD. MGR., Walter Schuler
ADV. PROD. MGR., A. M. Barrow
SUBSCRIPTION MGR., Rosalie Ashley
READER'S SERVICE MGR., Vincine Mogyorodi Bruzos

PRESIDENT & PUBLISHING MGR., Edward L. Henderson
VICE PRESIDENT & ADV. MGR., Robert M. Price
VICE PRES. & ASST. PUBLISHING MGR., Allen Schildhammer
WESTERN ADV. MGR., Rex Smith
EASTERN ADV. MGR., Frank Taylor
ADVERTISING OFFICES:
New York, 521 Fifth Ave. MUrray Hill 2-1928-9 Robert M. Price Frank Taylor
Chicago, 134 S. LaSalle St. FRanklin 2-8093 Rex Smith
Detroit, 450 W. Fort St. WOodward 2-0924 Allen Schildhammer
Los Angeles, 4710 Crenshaw Blvd. AXminster 2-9501 Justin Hannon

Member, Audit Bureau of Circulations. Member, Associated Business Publications.

VOLUME 86, NO. 13, SERIAL NO. 1,566, MARCH 30, 1959

Handy Way to Subscribe

To See the Industry In Action EVERY WEEK

Keep up-to-date on what's going on in your industry. You'll see action weekly in AIR CONDITIONING, HEATING & REFRIGERATION NEWS. Covers latest news and gives you top how-to-do-it reports on residential, commercial, and industrial air conditioning, heating, and refrigeration for contractors, dealers, consulting engineers, distributors, servicemen, and manufacturers. Read the industry's only newspaper every week—you'll profit by it—only $6.00 per year, 52 issues (U.S. and Canada). Foreign: $10 per year.

AIR CONDITIONING, HEATING & REFRIGERATION NEWS
450 W. Fort St., Detroit 26, Mich. 3-30-59

Send the NEWS every week for: ☐ One Year $6. ☐ Three Years $12.
☐ Payment Enclosed ☐ Bill Me ☐ Bill Company

Name.....
Company.....
Street.....
City..... Zone..... State.....
IMPORTANT: Company's Type of Business.....

Fedders Contest Winners To Visit Rome, Acapulco

MASPETH, N. Y.—Approximately 1,000 people will be airlifted to Italy and 3,8000 to Acapulco, Mexico, next fall as part of a sales incentive travel program sponsored for its dealers by Fedders Corp.

Salvatore Giordano, president of Fedders, said the trips are based on the number of Fedders air conditioners that are sold during the year.

On the Italian trip, Fedders dealers will spend five days in Rome, and four days in Naples, Capri, and Sorrento. Arrangements have been made for special sightseeing tours, trips through fashion houses, idea-exchange seminars with Italian merchants, and boat and motor-coach rides.

In Mexico, the Fedders guests will stay at the Hotel Caleta. A number of activities have been scheduled.

The European trip will begin about Oct. 1 when the first of the charters leave from New York, the jump off point. One plane will leave each day. The first of the Pan American flights to Mexico will take off about Sept. 15. With approximately five charters a week, this trip should last about nine weeks.

Fedders conducted its first travel incentive program in 1951 when 92 people were taken to Bermuda. Last year, 3,500 of its dealers were transported to Jamaica, BWI, and 670 went to the French Riviera.

Industrial Acoustics Holds Air Conditioning Sales Conference

NEW YORK CITY—Seventy-one sales representatives of the air conditioning department of Industrial Acoustics Co. attended IAC's first national air conditioning sales conference at the Hotel Lexington here recently.

The representatives, coming from 27 states and Canada, were greeted by IAC President Martin Hirschorn and air conditioning department manager Charles N. Rink.

During the weekend conference, the representatives heard talks by IAC executives on the application of sound suppression to the air conditioning, aviation, medical, and industrial fields and on the hearing conservation programs being instituted by industry. Ellis Singer, manager of IAC's medical department, spoke to the representatives on the relation of the ear to air conditioning system noise.

One of the highlights of the conference was a tour through Industrial Acoustics' plant at 341 Jackson Ave., The Bronx. The representatives were whisked to the plant by chartered subway train. Following a tour through the manufacturing and research facilities of the plant, the representatives were IAC's guests at a buffet lunch.

The wives of representatives were taken on a tour through the United Nations.

Floating Air Field

High Morale, Good Health, Safety Cited as Reasons for Air Conditioning 'Independence'

NEW YORK CITY — Three prime reasons for air conditioning the *Independence*, newest of the Navy's 60,000-ton attack aircraft carriers, were cited at commissioning ceremonies at the U. S. Naval Ship Yard in Brooklyn.

They are maintenance of high morale, good health, and safety for the 3,500 officers and crew aboard the multi-million dollar "floating airfield."

The cooling system supplied by Carrier Corp. for the fourth giant warship of its type, like those for the *Forrestal, Saratoga,* and *Ranger,* will be the largest afloat, the company said.

Clean, comfortable living and working areas are said by the Navy to give "habitability" new meaning. An optimum interior climate keeps the men alert, efficient, and happy.

Air conditioning's importance is increased by the ship's ability to cruise at speeds "in excess of 30 knots," bringing rapid changes in outside conditions.

In event of nuclear attack requiring sealing off of outside air, the system controlling temperature, humidity, and air distribution, would act similar to that in submarines until the ship had passed out of the radioactive area.

Since conducting a series of environmental and physiological tests at the National Naval Medical Center, Bethesda, Md., all new Navy ships include air conditioning.

Charles V. Fenn, vice president of Carrier whose seven centrifugal refrigerating machines on CVA 62 supply a total of 1,050 tons of cooling daily, noted shipboard heat loads are greater and vary more than those in landbourne systems.

He added that partitions for watertightness hinder escape of heat, further necessitating constant refreshing of air.

In keeping essential service machinery decentralized, the large-capacity chillers are located at different below-deck stations. When all units are operating at full capacity, nearly 3,800 gals. of water per minute are circulated to conditioning coils.

Though each cooling machine services a specific section of the vessel, they are inter-connected so that in an emergency two or more can be operated.

Standard for each man's sleeping bunk is an adjustable outlet for conditioned air. The amount of air circulated to berths, operation and control spaces, offices, mess areas, hospital, and recreation rooms is equivalent to that required by 20 theaters the size of Radio City Music Hall.

One advantage the seagoing system has over land-based networks is in condensing water for refrigeration machines. Instead of a cooling tower to reject heat to the atmosphere, two pumps furnish more than an adequate supply of salt water.

For your
REFRIGERATION, AIR CONDITIONING
and HEATING UNIT NEEDS . . .

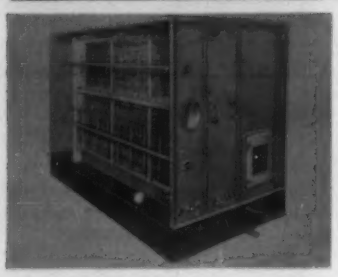
Specify Quality-Controlled
PHELPS DODGE COPPER TUBE!

- All tempers and sizes for use in original equipment.
- Straight length tube tempered to meet your bending and expanding specifications.
- Quality-controlled throughout manufacture to assure finest tube properties.
- Tubes degreased and capped, or dehydrated and sealed, if required.
- Deliveries geared to your production requirements.

First for Lasting Quality from Mine to Market!

PHELPS DODGE COPPER PRODUCTS CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Fort Wayne, Greensboro, N. C., Houston, Indianapolis, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N.Y., San Francisco, St. Louis, Seattle, Washington, D.C.



American Blower Adds To Dehumidifier Line

● A line of low pressure and high pressure blow-through sprayed coil dehumidifiers is now available from American - Standard, Industrial Div., Dept. AH&RN, Detroit 32.

The new units expand the established American Blower line of draw-through dehumidifiers.

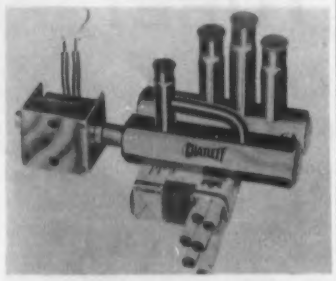
"The blow-through models meet the most stringent requirements established by the recent trends toward medium and high velocity all-air systems in multi-story buildings," the announcement said. "Both low and high pressure units are available in 127 sizes with capacities from 2,310 to 45,900 c.f.m. and for operation to 9-in. w.g. static pressure.

"The heavy-duty units feature a casing designed to provide a unit that is air and water tight when used in single zone, multizone, or dual duct blow-through systems."

Display Rack Holds 3 Air Conditioners

● Point of sale display racks for room air conditioners are now being carried in stock for sale to dealers, National Mfg. Co., Dept. AH&RN, P. O. Box 10087 Mc-Keller Station, Memphis, Tenn., announces.

The tubular aluminum racks are available to hold one, two, or three units. Stands are buffed to a high lustre resembling chrome.

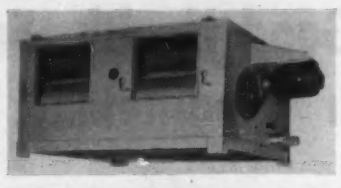


Reversing Valve Fits Window Type Units

● A "tailored-to-fit" reversing valve for window air conditioners has been announced by Chatleff Valve & Mfg. Co., Dept. AH&RN, P. O. Box 996, Austin, Texas.

A simple, yet versatile design is available in several basic port configurations, the company said. It is claimed to offer extremely low pressure drops (full ¾ in. internal porting), yet to have small cubic inch displacement.

'Krack' Cooler Designed for Banana Rooms



● A series of new "Krack" heavy-duty industrial product coolers was introduced by Refrigeration Appliances, Inc., Dept. AHRN, 901 W. Lake St., Chicago 7.

The 12 units in the series have rated efficiencies for high and low temperature rooms and banana rooms. Low temperature models, arranged for hot gas defrost, are equipped with a heating coil on the drain pan. Banana room units can be equipped with steam coils.

Air capacity in the series ranges from 2,640 to 13,200 c.f.m., the company said. There are three basic ceiling types. The units can be used in direct expansion systems and recirculated systems.

Thermostat Parts, Leads Sealed In Copper Cup

● Designed with sealed construction primarily for refrigeration and air conditioning applications are new "Klixon" 20420 Series thermostats, according to Versailles Products Div., Metals & Controls Corp., Dept. AH&RN, Versailles, Ky.

The thermostats are also suitable for other applications in their operating range of -20° to 167° F. where a sealed construction is desirable, it was stated.

"All operating parts and lead connections are contained within a copper cup which is sealed with an epoxy resin compound to completely exclude moisture, dust, or other contamination."

Damper Regulator Remotely Controlled

● An improved remote control damper regulator designed especially for remodeling work has been announced by Young Regulator Co., Dept. AHRN, 20910 Miles Ave., Cleveland 28.

The knob and plate of the No. 710 regulator are placed flush against the wall of a room. An extended shaft allows the mechanism, border plate, and the tubing to be installed in a closet or any other out-of-sight place without requiring channeling of the plaster for the tubing, or patching of the plaster for the remote control unit. The regulator can operate one or two dampers at a distance of 250 ft.

Piston Pump Delivers Small Air Volumes

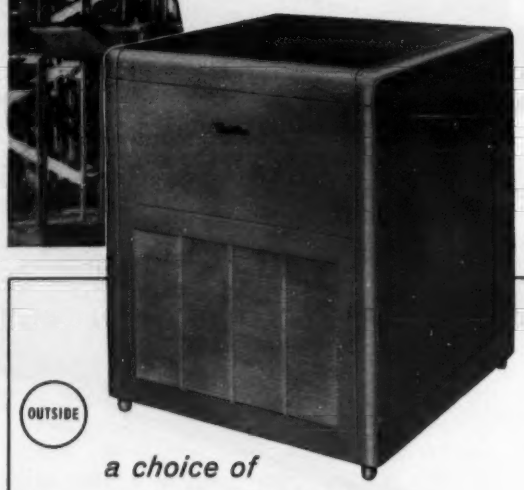
● Oil-less, piston air pump designed to deliver small air volumes at either low or high pressures is offered by Lee Mfg. Co., Dept. AH&RN, 226 W. 22nd St., Hialeah, Fla.

It is available in a variety of models weighing from 4 to 15 lbs. Displacement ranges from 400 to 1,200 cu. in. per minute.

In the Residential and Commercial Fields

Perfection® AIR CONDITIONERS

grab a giant chunk of this growing market with a line that's planned, priced and produced to sell it!



OUTSIDE

a choice of 3 air-cooled condensers

INSIDE

standard components make installations easy

NEW REMOTE CENTRAL SYSTEMS

THREE CAPACITIES of 2, 3 and 5 tons satisfy most all residential and small commercial requirements. While the 3 and 5-ton condensers are used with the components at the right, the 2-ton unit is furnished as a complete package, including thermostat, 25 feet of charged tubing, and its own evaporator coil for location in either vertical or horizontal ducts. All three are efficiently cooled by air. No piping or drain problems; no cooling towers.

YOU SAVE on installation because controls are included ready for simple hookup. (Both 3 and 5-ton units include process valves, sight glass, and liquid receiver.) Your customer saves too. Low operating costs result from Perfection's perfect balance of all components, providing more actual BTU's of cooling per watt of electricity than any comparable unit on the market today!

UPFLOW CIRCULATION exhausts warm air out the top, preventing damage to nearby grass and plant life. It's safer too. Condenser coils on top protect fan from falling debris, keep careless fingers out.

RUGGED, compact condenser cabinets are made from tough, rust proofed furniture steel that's approved for year-round outdoor service in severest climates. Weatherproof condenser coils are all copper with aluminum fins.

IN UPFLOW FURNACE, Perfection's patented new Flex-A-Coils are built on a telescoping frame that adjust easily to fit the plenum chamber above any upflow furnace. You save head room and permit duct to run in either direction. Only two sizes (3 and 5-ton) are needed to satisfy most jobs.

IN COUNTERFLOW FURNACE, Perfection's flat coils fit neatly beneath the furnace. Ideal for perimeter heating systems where blower capacity is sufficient for cooling. Coils are all copper with aluminum fins and furnished in both 3 and 5-ton capacities.

IN HORIZONTAL DUCT, these easily installed horizontal coils are mounted in a rust-proofed steel casing that fits flush with duct walls. Fittings are all included to simplify suction, liquid, and drain connections.

WITH AUXILIARY BLOWER in horizontal duct where furnace blower capacity is inadequate for cooling, this compact, belt-driven blower installs flush with the duct and combines neatly with Perfection's matching horizontal coil. Two sizes include 3 and 5-ton capacities.

A PERFECTION VERTICAL AIR HANDLER is also available. In this attractive, vertical cabinet, Perfection combines both blower and coil unit for residential and commercial applications. To tie in with existing systems, only a short duct run and bypass damper are needed.

Pump Designed for Small Towers, Chillers

● A direct connected centrifugal pump designed specifically for small cooling tower and chilled water applications has been introduced by The Triangle Mfg. Co., Detroit.

The pump, trade-named "Cool-Flo," is distributed exclusively by Thermalair Engineering Co., Dept. AH&RN, 7535 W. Eight Mile Rd., Detroit 21.

"The pump is of all bronze construction and is provided with a high quality mechanical seal," the announcement said. "Available with either ¼ or ⅓ hp., 3,450 r.p.m., 110 or 220-volt, 60-cycle, 1-phase General Electric motors with rubber mounted base and built-in thermal protection, the pump has a 1¼-in. FPT suction connection and 1-in. FPT discharge connection.

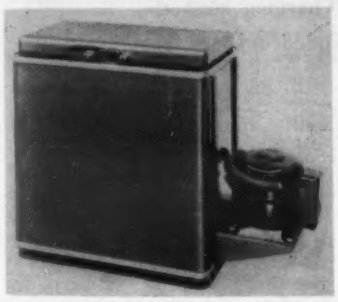
"The ⅓-hp. pump capacity varies from 40 g.p.m. of water at 22-ft. head to 2½ g.p.m. at a 34-ft. head. The direct connected impeller eliminates bearings in the pump so that the entire assembly is only slightly larger than the motor itself."

Want More Details?

ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.

Tell him: "AH&RN sent me!"

Offers New Ice Cream Holdover Truck Cabinet



● A new ice cream holdover truck cabinet, adaptable for every type of installation in retail delivery trucks, has been introduced by the Refrigeration Div., The Brewer-Titchener Corp., Dept. AH&RN, New Milford, Pa.

Flexible feature of the cabinet is a separate hermetic compressor unit that may be used remotely or can be adjusted to any height on the back or either end of the cabinet to accommodate every sort of truck installation, it was explained. An expanded metal housing fits over the compressor unit for protection.

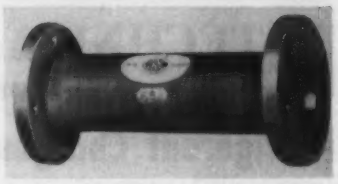
New design and construction eliminates the need for a separate finned condenser with fan and motor, thus making possible a more compact unit, the company said. The refrigerated cabinet has a 2.4-cu. ft. capacity and holds 30 half-gal. ice cream containers.

All handles, knobs, and hinges have been recessed within the contours of the outer surfaces.

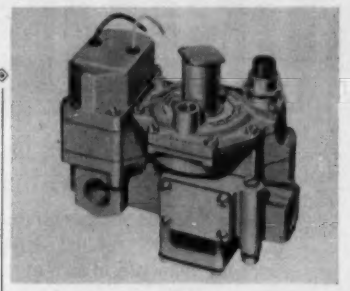
Rubber Compound Resists Corrosion, Abrasion

● Development of a special abrasive and corrosive-resistant rubber compound, "Tuf-Flex," has been announced by General Rubber Corp., Dept. AH&RN, 52 Summit St., Tenafly, N. J.

The compound is said to have given excellent results in GRC rubber expansion joints and pipe installations in systems handling abrasive or corrosive liquids, slurries, suspensions, and solids, it is noted.



Tuf-Flex units are also designed for use in air conditioning and refrigeration systems, according to the company. They are available in standard sizes from ½ to 72 in. i.d. with either duck and rubber or duck and neoprene integral full-faced flanges or new integral "Gen-Lok" ends. GRC rubber pipe is available in any length up to 50 ft.



Single Unit Gas Control Does Work of Four

● A single unit gas control for furnaces and unit heaters that is claimed to do the work of four individual controls has been made available by the Heating & Air Conditioning Controls Div., Controls Co. of America, Dept. AHRN, 2450 N. 32nd St., Milwaukee, it was announced.

A pressure regulator, 100% safe shut off, safety-assured lighting, and thermo-magnetic safety pilot are important built-in features, the company said.

Engineered to fit the specified needs of heating equipment manufacturers, the Series 5250 "all-in-one package results in labor savings by permitting a reduction in assembly steps and inspection procedures in the manufacturer's plant," the announcement stated.

Seal Designed To Stop Terminal Leaks Instantly

● Addition of the all-new "Derco" terminal seal to its line has been announced by Watsco, Inc., Dept. AHRN, 1020 East 15th St., Hialeah, Fla.

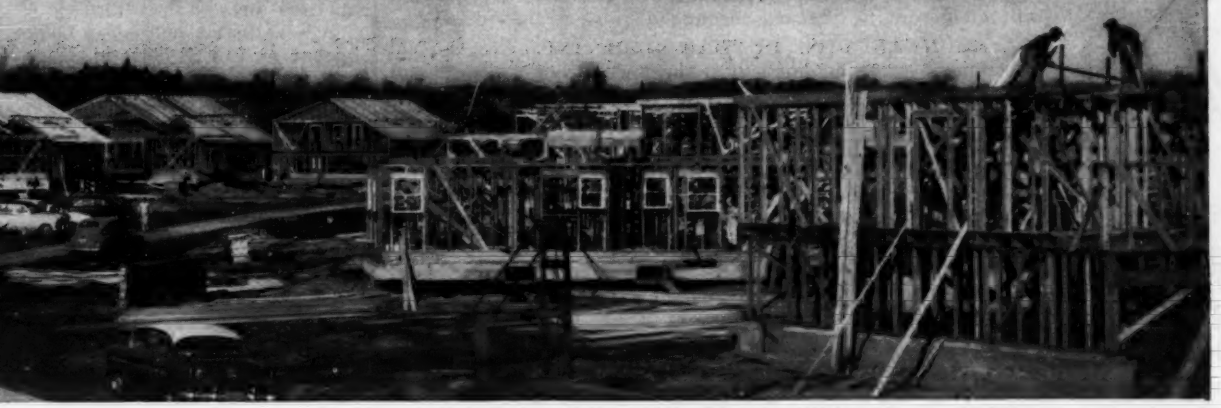
The seal is designed "to stop terminal leaks instantly without opening the compressor," the announcement said.

"The new Derco seal has a bakelite body which is not affected by temperature changes. Each seal has its own electrical connector and a nylon insulator cap for added electrical protection. The over-all height of the seal is short enough to allow replacement of the terminal cover.

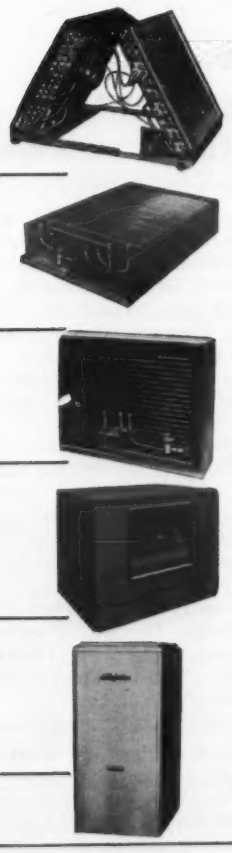
"Designed for most sealed units, these terminal seals can be installed in just three minutes, while on the job."

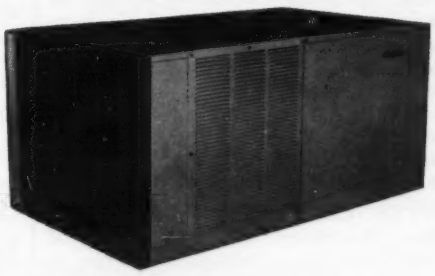
Included in each set of Derco seals, at no extra charge, is a time and labor saving tool specially designed to facilitate the removal of frozen or rusted nuts from the terminal posts, according to Watsco. This duo-purpose tool may also be used for tightening the terminal seal on the dome, it is noted.

and HEAT PUMPS MEAN BUSINESS!



FIT ANY JOB





NEW AIR-COOLED HEAT PUMPS AND AIR CONDITIONERS ARE EFFICIENT, VERSATILE

TUCKAWAY HEAT PUMPS

Completely automatic, air-cooled, and electrically powered, the new self-contained Tuckaway heat pump (in 2, 3, and 5-ton sizes) is ideal for residential and small commercial use. Its compact design permits a variety of mountings and adds new flexibility to central-system installations, either tied in with existing duct runs or with a special supply chamber over the blower end for use without ductwork. Thanks to engineering advances, the new Tuckaway is performing with outstanding success in applications that until now seemed impossible!

TUCKAWAY AIR-CONDITIONERS

Efficiently air-cooled, Perfection's new Tuckaway provides the comforts of central-system air-conditioning without expensive plumbing. These compact, self-contained units can be suspended from ceilings, or tucked away in attic, basement, transom or crawl space. Offered in 2, 3 and 5-ton capacities.

REMOTE HEAT PUMPS

Air-cooled. Quiet blower-coil is installed indoors, requires no floor space. Compressor section located outdoors gives complete flexibility of installation. Fully automatic operation, with top cooling and heating efficiency in a wide range of conditions and sizes from 3 H.P.

REFRIGERANT **22**

Perfection now makes refrigerant 22 in 10, 25, or 50-lb. sizes available to dealers on direct purchase through local distributors. For full details, see your Perfection distributor.

Be a PERFECTIONist this year.

FOR COMPLETE INFORMATION ON PERFECTION AIR CONDITIONING, ATTACH THIS COUPON TO YOUR LETTERHEAD AND MAIL TO PERFECTION INDUSTRIES.

Name_____

Firm _____

Street Address_____

City_____ State_____

THE FORWARD TREND IN HOME COMFORT

Perfection®

INDUSTRIES, DIVISION OF

HUPP Corporation 1135 Ivanhoe Rd. Cleveland 10, Ohio

TECHNICAL CENTER

By Frank J. Versagi, Technical Editor

Refrigerant Charging Procedures (4)

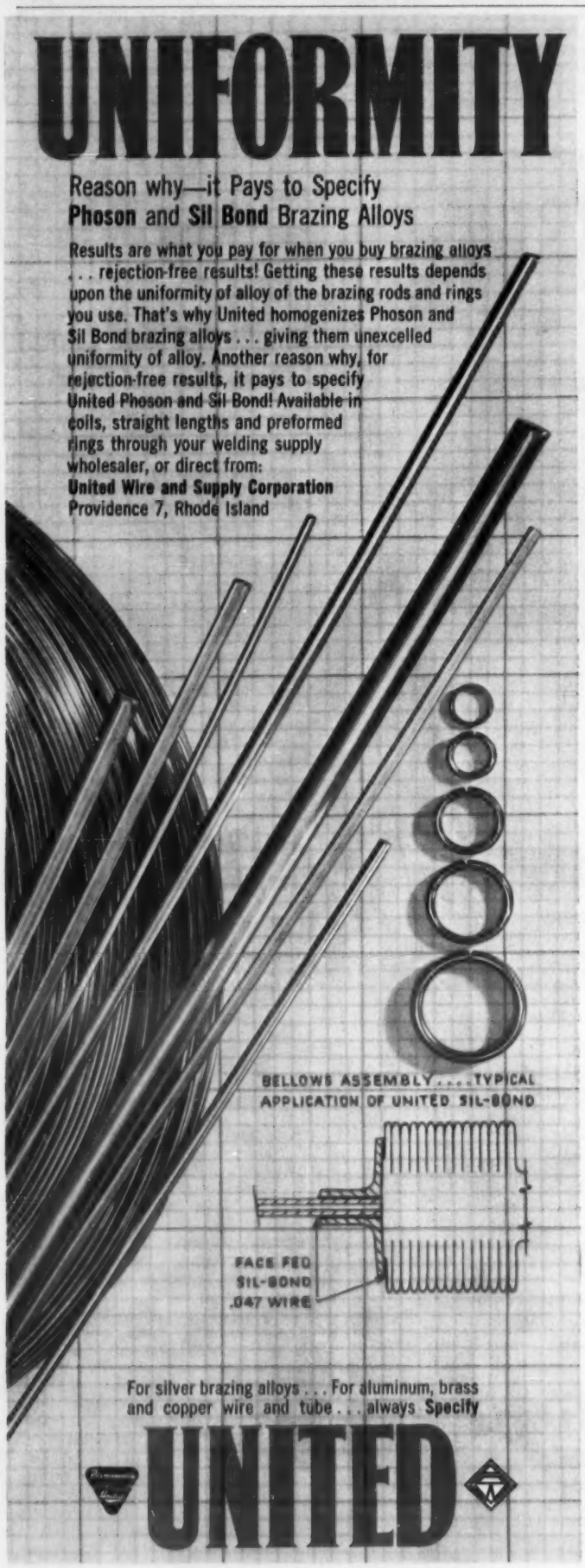
Three basic charging methods have been discussed—Vapor phase into low side; liquid phase into low side; liquid phase into high side.

The outline summarizes the advantages and disadvantages of each method; the serviceman who intends to use a method unfamiliar to him will be wise to determine whether the alternate method is applicable to the specific compressor or system he is dealing with.

In all cases, he should not attempt a new charging method until he has picked up the know-how from a training school or from a more knowledgeable serviceman.

Outline of Refrigerant Charging Methods

Charging Method	Advantages	Disadvantages
VAPOR LOW SIDE	Universally applicable Safest on equipment Overcharging unlikely Prevents entrance of dirt from service cylinder	Slow—cylinder temperature drops, necessitating clumsy or unsafe warming techniques (heating with torch)
LIQUID LOW SIDE	Fast	Cannot be used on all equipment Possible damage to compressor Most mfrs. do not recommend Possible lubrication difficulties
LIQUID HIGH SIDE	Fast; necessary on large systems Recommended on some rotary compressors	Danger of overcharging Possible damage due to localized excessive hydraulic pressure


UNIFORMITY
Reason why—it Pays to Specify
Phoson and Sil Bond Brazing Alloys
Results are what you pay for when you buy brazing alloys . . . rejection-free results! Getting these results depends upon the uniformity of alloy of the brazing rods and rings you use. That's why United homogenizes Phoson and Sil Bond brazing alloys . . . giving them unexcelled uniformity of alloy. Another reason why, for rejection-free results, it pays to specify United Phoson and Sil Bond! Available in coils, straight lengths and preformed rings through your welding supply wholesaler, or direct from:
United Wire and Supply Corporation
Providence 7, Rhode Island
BELLOWS ASSEMBLY . . . . TYPICAL APPLICATION OF UNITED SIL-BOND
FACE FED SIL-BOND .047 WIRE
For silver brazing alloys . . . For aluminum, brass and copper wire and tube . . . always Specify
UNITED

How Compressor Manufacturers Feel About — Refrigerant Charging Procedures

AIRTEMP DIV.—With reference to packaged unit and condensing unit equipment, we do not recommend or approve charging liquid refrigerant into the compressor at any time. All Airtemp units have a liquid line shut-off valve with charging port that provides a convenient and safe means of charging liquid refrigerant into the system.

BENDIX-WESTINGHOUSE — Any Bendix-Westinghouse unit which is installed in a system that has a limited charge not in excess of 2 lbs. of R-12 or 22, such as charges used in window air conditioners, can safely be charged in liquid form into the low side.

COPELAND REFRIGERATION CORP.—We would not at any time recommend the charging of liquid refrigerant into the low side of any Copeland condensing unit. We suggest that all refrigerant be charged through a good strainer-drier.

BRUNNER DIV., DUNHAM-BUSH, INC.—We do not recommend charging liquid into the low side of a compressor at any time. Vapor charging, low side, is used on smaller machines, but on any but these smaller systems, we recommend charging through the liquid line.

CARRIER CORP.—Liquid refrigerant should never be allowed to go directly to a compressor. Liquids should not be admitted to the low side unless it can be done at the evaporator where it can be vaporized before going to the compressor.

FRIGIDAIRE—On our "Meter-Miser" compressors, used in household refrigerators and food freezers, the charging fitting is located on the high side of the system, and liquid refrigerant is charged into the system from a portable charging cylinder.

On our commercial compressors we have always recommended vapor charging into the low side of the system.

Since 1956, with the introduction of our super Meter-Miser (sealed-in-steel reciprocating) compressor which we use on our room air conditioning products, we do have a low-side compressor. In charging these compressors we use the same portable charging setup as used on household compressors, letting liquid refrigerant flow in through the charging fitting after a deep vacuum has been drawn.

You will please note that the compressor does not run during this charging operation; consequently, we do not call it a liquid refrigerant charge through the low side.

TECUMSEH PRODUCTS CO.—If system is charged through low side, introduce the charge in vapor phase. If system is charged through high side, introduce charge in liquid phase.

WESTINGHOUSE ELECTRIC CORP.—We are reluctant to recommend liquid charging into the low side of compressors, although we feel that this procedure can be performed by a highly responsible mechanic or serviceman.

YORK DIV.—Our procedure is completely to evacuate a system and to put the charge into the low side as quickly as possible. This is liquid charging with the compressor not operating, but we do not approve the use of this procedure by any who have not learned it first hand.

Honeywell Will Spend $1,500,000 To Expand Production In 4 Factories

MINNEAPOLIS—At an estimated cost of $1,500,000, Minneapolis-Honeywell Regulator Co. is adding a total of 110,000 sq. ft. of factory space to boost production at four of its plants, it has been announced.

A 38,000-sq. ft. addition in Wabash, Ind. will enable the firm to increase production of air cleaning and filtering equipment. The expansion will give that plant a total of 96,000 sq. ft. At its Appliance Controls division plant in Los Angeles, the company plans to up plant space to 190,000 sq. ft. by adding 20,000 ft.

In Denver, a 12,000-sq. ft. addition to the firm's Heiland division plant will increase occupied space there to more than 70,000 ft. A 40,000-sq. ft. addition at St. Petersburg, Fla. will increase to 155,000 ft. the size of a plant there which makes and tests inertial guidance systems for missiles.

Penn Controls Moves 5 District Offices

GOSHEN, Ind. — Penn Controls, Inc. announced that five of its district offices have been moved to new locations.

Penn's eastern regional warehouses and New York district office have been consolidated at 1024 Edgewater Ave., Ridgefield, N. J. The warehouse manager is Raymond P. Burke, who is under the direction of George Sander, district manager, and Jim Garrett, sales engineer. The Philadelphia and Newton, Mass. district offices and staff remain at their present locations.

A new district office has been opened at 713 S. 59th St., Birmingham, Ala. William P. Marshall is the district manager. He previously served as a sales engineer at Houston, Texas.

The Atlanta district office is now located in Doraville, Ga., Box 306. Joseph Chomel, who was sales engineer for the Atlanta district, has been named district manager.

Harold King, former district manager at Atlanta, has been named manager of the Chicago district office which has been moved to 19W 645 Roosevelt Rd. in Lombard, Ill.

The Milwaukee district office has been moved to larger quarters at 4738 W. Lisbon Ave., Milwaukee. Harold Gray, district manager, said the new office was more centrally located.

WSL Gets Contract To Treat Water In New York General Bldg.

NEW YORK CITY—A contract to treat the water used in the newly-installed air conditioning system of the 35-story New York General building at 230 Park Ave. to prevent corrosion has been awarded to Water Service Laboratories, Inc., it was announced by the firm of chemical engineers and specialists in water treatment.

Equipment to be treated includes the primary chilled water system, two secondary chilled and heated systems, nine spray dehumidifiers, and the cooling tower water. The system has a capacity of 3,000 tons.

The contract was awarded by the Walker-Brandt Corp., a joint venture of A. D. Walker Co. and Eugene Brandt Co., mechanical contractor.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

WHAT . . WHEN . . WHERE

— A Guide to Coming Events of Interest

Gas Appliance Manufacturers Association
April 1-3, Americana hotel, Bal Harbour, Fla.

Refrigeration Research Foundation
April 2-5, Statler and Mayflower hotels, Washington, D. C.

Edison Electric Institute
April 5-9, New Orleans.

Mechanical Contractors of America Convention
April 28-May 1, Shoreham hotel, Washington, D. C.

Oil-Heat Institute of America
April 29-May 4, Olympic hotel, Seattle.

Air-Conditioning & Refrigeration Institute
May 3-6, The Homestead, Hot Springs, Va.

National Heating Wholesalers Meeting
May 10-12, Ambassador hotel, Los Angeles

Industrial Heating Equipment Association Meeting
May 17-20, The Homestead, Hot Springs, Va.

Sheet Metal & Air Conditioning Contractors Annual Convention
May 28-30, Broadmoor hotel, Colorado Springs, Colo.

Institute of Appliance Manufacturers
June 1-3, Netherland-Hilton hotel, Cincinnati.

American Society of Heating, Refrigerating & Air Conditioning Engineers
June 22-24, Lake Placid Club, Lake Placid, N. Y.

New Unitary Air Conditioner Directory Lists Data on Models of 36 Companies

WASHINGTON, D. C. — A new "Directory of Certified Unitary Air-Conditioners," listing 1,234 current models of 36 of the 42 companies participating in the ARI-NWAHACA "Unitary Air-Conditioner Certification Program," was published recently by the Air-Conditioning & Refrigeration Institute.

In addition to the companies whose models are listed and rated under ARI standards, six other manufacturers have signed contracts to participate in the program; their certified models and ratings will appear in subsequent issues of the directory.

"The 42 companies which have now signed contracts to test and rate their unitary models according to applicable ARI standards represent well over 80% of total industry shipments of unitary equipment," the ARI said.

Air conditioners covered by the program include all types of central residential air conditioners and many unitary installations used in commercial and industrial establishments, but not room air conditioners, heat pumps, or large field-assembled systems. The top capacity of units in the program is 135,000 B.t.u.h.

The new directory will be widely distributed to contractors, builders, government purchasers at all levels, and to distributors and dealers within the industry.

Copies of the directory also will be available to the public, either through dealers, Better Business Bureaus, or from the ARI.

At the same time it was announced by Frederick J. Reed, chief engineer of ARI, that the ARI Unitary Section has authorized publication of complete directories on May 1, July 1, and Oct. 1, this year, rather than supplements as previously planned.

Each new edition will obsolete all previous editions, since it will include the names of additional companies, together with their listings which have entered the program since the previous issue, as well as ratings of additional models and changes in ratings of already-listed models.

The program for testing, rating, and certifying unitary equipment was developed by the Unitary Air-Conditioner Section of ARI, with the cooperation of the National Warm Air Heating & Air Conditioning Association, and is based on two ARI standards — 210-58, "Unitary Air-Conditioning Equipment," and 250-58, "Heat-Operated Unitary Air-Conditioning Equipment."

A nationwide publicity and promotion program has been launched to acquaint the trade, builders, architects, engineers and contractors, and the public, with the program.

Latest manufacturers of unitary equipment who have signed contracts include:

Armstrong Furnace Co., Div. of National Union Electric Corp., Columbus, Ohio; Columbia Specialty Co., Inc., Chevy Chase, Md.; Fraser & Johnston Co., San Francisco; Frigidaire Div., General Motors Corp., Dayton; Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, Ohio; Miami Products, Inc., Miami, Okla.; Southwest Mfg. Co., Aurora, Mo.; and Therm-Air Mfg. Co., Peekskill, N. Y.

Other participants were listed in the Feb. 23 NEWS.

SPECIAL SIZES IN 5 DAYS

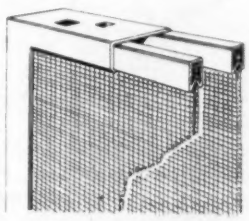
Permatron Trade Mark

Lifetime Electrostatic Air Filters
Guaranteed Shrinkproof

Shipped in five days or less, Permatron's quick, special size service doubles your normal market for permanent air filters. No minimum order. Available in ¼", 1" and 2" models.

Permatrons are super-charged, have more holding power, allow better air flow and are guaranteed shrinkproof up to 250° F. Can be vacuumed or washed easily. Metal frames are bonderized and galvanized.

Permatron is standard equipment on more leading brands of air conditioners and warm air furnaces than any other filter of its type. Ask your jobber or write to us for complete technical data.



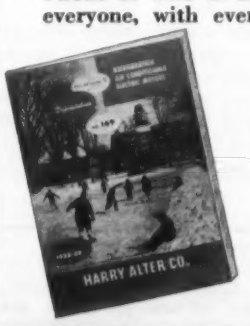
The unique Accumulator Chamber greatly increases the effectiveness of dust and dirt extraction.

Permatron Corporation
4840 North Linder Ave. Chicago 30, Ill.

THE MASTER SERVICE MANUALS - - -
— — — and other books of the Refrigeration Library are depended upon as textbooks in trade schools from coast to coast.
BUSINESS NEWS PUBLISHING CO., DETROIT

OVER THE COUNTER OR THRU THE MAIL

There are six well-stocked Harry Alter warehouses located for your convenient pick up. Mail orders are shipped the same day as received, to *anywhere* in the world. Phone or wire us and you'll usually have it the next day. We are nearby to nearly everyone, with everything they need.



We're Real Specialists in

REFRIGERATION • AIR CONDITIONING • ELECTRIC MOTORS

SUPPLIES and PARTS

SAVE MONEY, time and effort by ordering from our new *Dependabook*, the most complete catalog of all. 160 pages. Over 10,000 items carried in stock. *Wholesale only.* Your orders filled really fast by mail, or picked up at one of six big warehouses.

Write on your letterhead for the 1959 DEPENDABOOK . . .
Also our monthly Flyer of surplus and close-out Bargains.

The HARRY ALTER CO., Inc. Chicago 16, Ill. 1417 S. Wabash Ave. | New York 13, N. Y. 134 Lafayette St. | Dallas 2, Tex. 122 Parkhouse St. | Atlanta 18, Ga. 690 Stewart Ave., S. W.

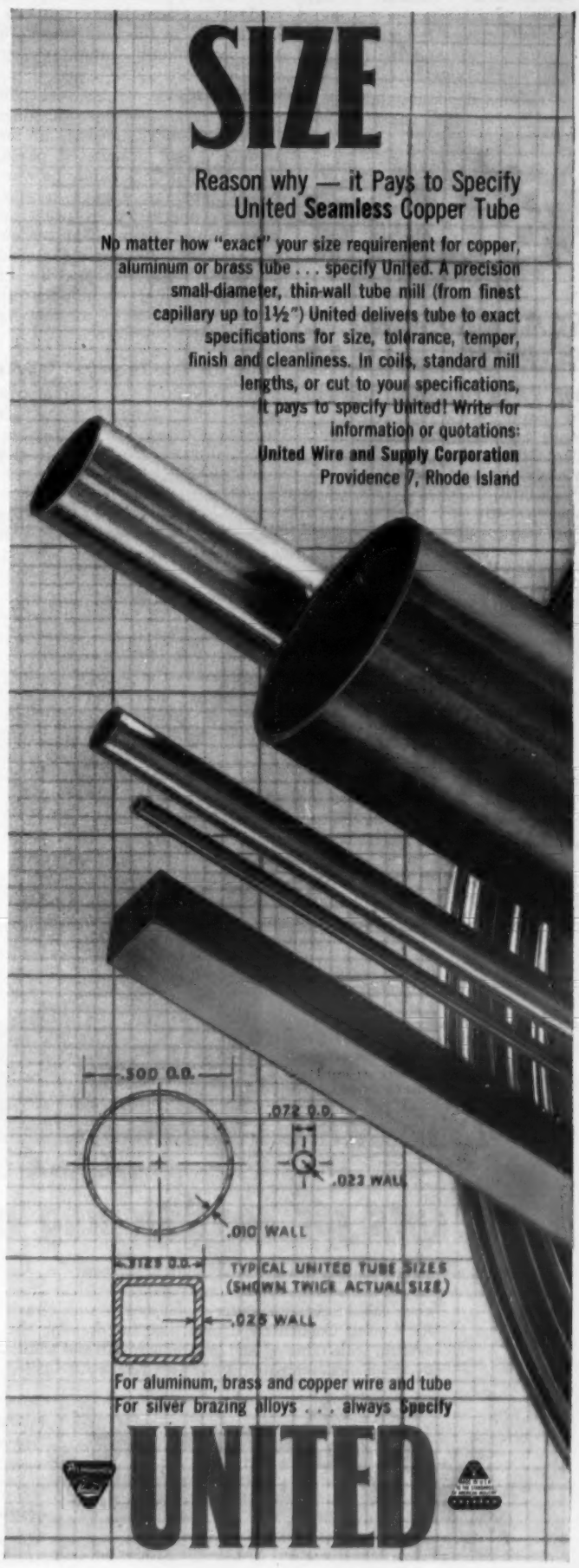
FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

SIZE

Reason why — it Pays to Specify United Seamless Copper Tube

No matter how "exact" your size requirement for copper, aluminum or brass tube . . . specify United. A precision small-diameter, thin-wall tube mill (from finest capillary up to 1½") United delivers tube to exact specifications for size, tolerance, temper, finish and cleanliness. In coils, standard mill lengths, or cut to your specifications, it pays to specify United! Write for information or quotations:

United Wire and Supply Corporation
Providence 7, Rhode Island



For aluminum, brass and copper wire and tube
For silver brazing alloys . . . always Specify

UNITED

Fundamentals of Air-Moving Systems

(1) How an Air-Moving System Works

By L. C. Linstrom
Air Impeller Div., Torrington Mfg. Co., Torrington, Conn.

The purpose of an air impeller is to move air in order to heat, cool or ventilate. Ducts, grills, plenums, and other parts of an air-moving system are designed to collect and distribute that air wherever and as it is needed.

The basic objective in designing and installing air-moving equipment—whether window air conditioners, central heating units, ventilators—is to match properly the impeller which moves the air and the flow system which distributes it.

While this statement seems obvious enough, there are mistakes being made every day by both the equipment designer and installation contractor in just this direction. The most damaging mismatches of impeller and system in the long run aren't the big ones, which are discovered and corrected right away, but the small ones which produce inefficient, noisy, and erratic performance. In this way a poorly matched impeller and air system hurts the customer and, in the long run, both the equipment manufacturer and installer.

The purpose of this series of articles is to describe the most important characteristics of air impellers and associated parts, like fan orifices and blower-wheel housings, always in relation to operation in practical air-moving systems. The article will not only cover theoretical analysis or design factors of interest only to manufacturers of impellers and air-moving equipment.

How an Air Impeller Works

A rotating fan or blower wheel adds energy to the air traveling through it by increasing the air pressure as it passes from the impeller inlet to outlet. Because the outlet air pressure is then higher than the pressure further down the duct and in the area being served, the air flows towards the lower-pressure regions.

The curve in Fig. 1 shows the performance of a typical air impeller (in this case, a blower wheel). On the left-hand vertical scale, static pressure is given as measured at the output of the impeller in inches of water. Rate of air flow in cubic feet per minute is shown on the horizontal scale.

Point A where the performance curve meets the vertical pressure scale shows that static pressure that exists when a shut-off condition exists, when the impeller output is feeding into a closed duct or chamber and no flow exists.

At Point B on the horizontal scale, the same air impeller provides maximum air flow in a free-flow condition in which no resistance to flow exists—a condition which can't really exist in any practical system. At amounts of air flow corresponding to points on the curve between A and B, the air flow output increases as the resistance to flow in the air-moving system decreases.

Air flow in a system is resisted by both friction in the duct and energy that is absorbed by air turbulence. Duct friction and turbulence loss—both measured in static pressures reduction per foot of duct length—have been calculated in terms of air velocity and are available in standard reference books. Theoretical and measured friction losses are given for various combinations of duct diameters and degrees of surface smoothness, as well as for elbows, grills and non-circular ducts.

The total flow resistance of a particular duct system can then be determined for various air velocities in that system. It is possible to determine what total pressure (static pressure plus velocity pressure) must be added to overcome system resistance (static pressure) and maintain a certain air velocity (velocity pressure)—or a certain air flow rate, which equals air velocity times duct area.

The curve in Fig. 2 gives the resistance curve for a particular duct system. The curve would be entirely different for another duct system. At a particular point C on the system-resistance curve, for example, the impeller must add sufficient energy both to overcome the existing system resistance, represented by the static pressure $P_s = 0.925$ inches of water, and maintain an air flow rate of $Q = 1{,}000$ c.f.m.

Assuming that the blower wheel in Fig. 1 might be considered a good selection for the air-moving system in Fig. 2, let us plot in Fig. 3 the performance curve from Fig. 1 on the same scale as the system-resistance curve from Fig. 2.

These two curves will cross at a point D—the only point in that system where both the impeller will develop sufficient energy to produce 1,500 c.f.m. at 2.0 inches of water and where the system has a resistance of 2.0 inches of water at a flow rate of 1,500 c.f.m. For this example, it is evident that although the blower wheel of Fig. 1 will operate in the system of Fig. 2, air delivery in that system is too high for the specified static pressure of 0.925 inches of water and a flow rate of 1,000 c.f.m. The impeller in this case is mismatched.

(To Be Continued)

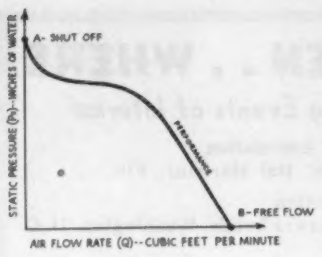


FIGURE 1

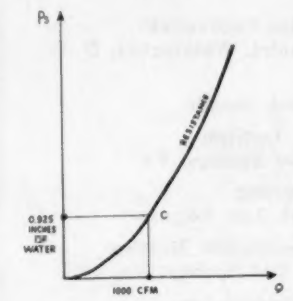


FIGURE 2

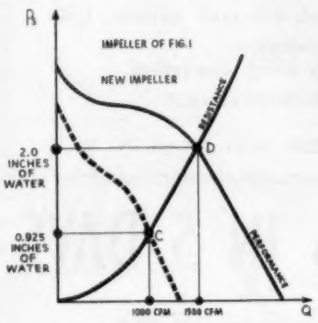


FIGURE 3

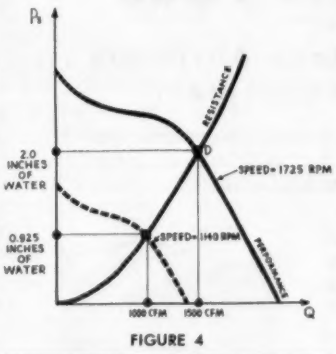


FIGURE 4

Name Turner Contractor For United Engineering Center In New York

NEW YORK CITY — Turner Construction Co. has been named as the general contractor for the United Engineering Center.

This new headquarters of the nation's leading engineering societies will be erected on the west side of United Nations Plaza between 47th and 48th Sts. here.

The announcement was made by Andrew Fletcher, president of United Engineering Trustees, Inc., and president of St. Joseph Lead Co. of New York.

The Center, a $10,000,000 tower structure of 18 stories, with about 260,000 sq. ft. of floor space, will house ten national engineering societies devoted to the advancement of engineering knowledge and practice. Among them is the American Society of Heating Refrigerating & Air-Conditioning Engineers.

Engineering Societies Library will also be housed in the Center, as will five joint groups dealing with engineering research and improved educational standards.

Space has been set aside in the building for educational exhibits which will dramatize the creative role of engineers in advancing world living standards. The metal, glass, and limestone structure, fully air conditioned, will occupy a site of 37,000 sq. ft.

Architect for the new Center is Shreve, Lamb & Harmon Associates; the structural engineer is Seelye, Stevenson, Value & Knecht; and the mechanical engineer is Jaros, Baum & Bolles.

United Engineering Trustees is an organization set up by participating engineering societies to perform management functions in their joint behalf, and is in charge of the planning and operation of the new Center.

BLAST
SCALE...SLIME...
SLUDGE...ALGAE
but SAVE the EQUIPMENT!
For Easier Work . . .
More Satisfied Customers . . .
DEMAND . . .
VAPCO SCALE REMOVER
The SAFE cleaner in powder form!
VAPCO-HIB
For those who "Make Their Own" cleaner!
VAPCO-PHOS NUGGETS
To keep cleaned jobs really clean!
VAPCO SLIME-X
To knock out algae and slime!
VAPCO Ice Machine Cleaner
Safe for all makes and models!
Complete literature on request or see your dealer—TODAY!
GUARANTEED Vapco PRODUCTS
MANUFACTURED BY The GARMAN Co.
SAINT LOUIS 33, MISSOURI

160 tons of Air-Cooled Freon Condensers, supplied by F. H. Langsenkamp Co., Indianapolis wholesaler, play a major part in one of the industry's largest air conditioning systems at the Indiana Gear Works, Inc.

INDIANA GEAR WORKS
cuts air conditioning maintenance costs 40%

John Kingsbury, Air Conditioning Equipment Co., Indianapolis, solved a costly maintenance problem when he replaced a previous water-cooled system with Krack Air Cooled Condensers. Down time for draining the system, scale removal and general summer and winter overhaul was eliminated. Now with Krack Air Cooled Condensers, the push of a button starts or stops the system any time of the year.

Krack Condensers offer more coil surface to give you lower condenser temperatures and higher mechanical efficiencies. Capacities: 1 to 50 tons.

Send coupon today—for helpful bulletin.

KRACK REFRIGERATION APPLIANCES, INC.
Manufacturers of freon, ammonia, flooded ammonia heat transfer equipment

REFRIGERATION APPLIANCES, Inc., 801 Lake St., Chicago 7, Illinois
Send free bulletin giving all technical details.
Name
Firm
Address
City Zone State
8658

For Your Reprint Copy

"Short, Short Course in Air Conditioning Fundamentals." By D. C. Schaffer. Mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.

Refrigeration Problems
And Their Solution
(As Written by Paul Reed)

Thermometer In Service Work (4)

Another very handy use for two thermometers is to check for presence of air in the system.

If we have a cylinder with some liquid refrigerant in it, the vapor above the liquid is "saturated" and is at a pressure corresponding to the temperature of the liquid, as shown in the "Saturation Tables" for that refrigerant.

However, if the actual pressure in the cylinder is higher than saturation pressure for the liquid refrigerant, it is an indication that there is some other gas mixed in with the saturated vapor, for if there are two gases in a container, the total pressure is equal to the two pressures added together (expressed in pounds per square inch absolute).

For this test to be accurate, the temperature and pressure should be in equilibrium, that is, constant and unchanging. This is most easily accomplished by allowing the cylinder of refrigerant to stay in a room long enough for the cylinder and its refrigerant to come to and remain at room temperature; and, of course, the temperature of the room should be fairly constant.

DETECTING NON-CONDENSABLES

Instead of a cylinder, we can use just about any type of container for the refrigerant, such as a coil of tubing or a condenser, so this test can be used to determine whether or not there are "non-condensables" (usually air) in a refrigerating system. A "non-condensable" is any gas that condenses at such high pressures or at such low temperatures, that it remains as a gas under conditions found in the refrigerating system.

For accuracy, the condensing unit should not be running; moreover, it should be off long enough for the refrigerant to come to equilibrium. So we should first stop the condensing unit.

Install a high pressure gauge in the gauge port of the discharge service valve or any other gauge connection in the upper part of the condenser. The gauge must be accurate; not only at zero, but also at condenser pressure, for it will indicate the pressure in the condenser.

Then attach a thermometer to the lower part of the condenser, or on some units, to the refrigerant outlet of the condenser. On other units, this can be near the condenser, but on the small line between the outlet of the condenser and the inlet of the receiver.

To keep the thermometer from being affected by room temperature, wrap a small piece of dry cloth around the thermometer bulb and the line to which it is attached. This thermometer must be accurate, for it indicates temperature of the liquid refrigerant.

Leave the unit off long enough so that you are sure that there is no more superheat and the vapor in the condenser is the same as the temperature of the liquid refrigerant. In the case of an air-cooled unit, it is well to leave the unit off until the condenser is down to room temperature.

To determine whether it is or not, hang another accurate thermometer in the room air near the condenser, but where it is not affected by warm objects or cool air drafts.

After the two thermometers read the same, take the temperature of the thermometer on the liquid outlet line and look this temperature up in the temperature-pressure tables of the refrigerant being used in the system.

The corresponding pressure given in the tables should be the same as the reading of the gauge. If the gauge reads *below* the pressure given in the tables, something is wrong; you have read something incorrectly or the gauge or thermometer is inaccurate.

If the gauge reads *above* the pressure shown in the tables, it is an indication that there is some air or other non-condensable gas in the condenser along with saturated refrigerant. If this is true, purge the condenser *slowly* from the top of the condenser.

The same general procedure is used with water-cooled condensers;

However, room temperature is not much of a factor in a water-cooled condenser. Therefore, to assure equilibrium, open the water valve so that water flows freely through the condenser even with the unit not running.

Occasionally check the temperature of the inlet water to the condenser and of the outlet water leaving the condenser. When they read the same, and there is no temperature rise of the water in passing through the condenser, there should be no superheat in the gas in the condenser.

As in the case of the air-cooled condenser, take the reading of the thermometer indicating liquid refrigerant temperature, look it up in the saturated refrigerant tables and find the corresponding pressure in p.s.i.g.

This pressure should be the reading of the gauge on the condenser. If the gauge reads *lower* than the pressure shown in the tables, again something is wrong. There is some inaccuracy of the gauge and/or thermometer, or in reading them.

If the gauge reads *above* the pressure shown in the tables, the presence of air or other non-condensables is indicated, and they should be purged the same as in the case of the air-cooled unit.

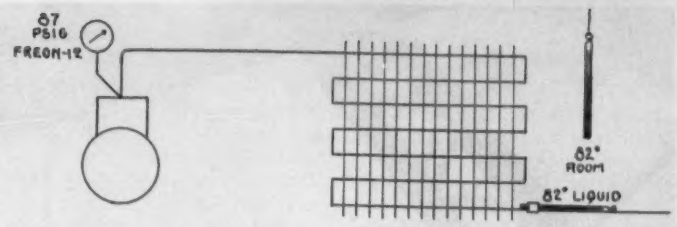


FIG. 5—Use of thermometers and head pressure gauge to check for the presence of air or other non-condensables in an air-cooled system. Test shows this condenser to be free of non-condensables.

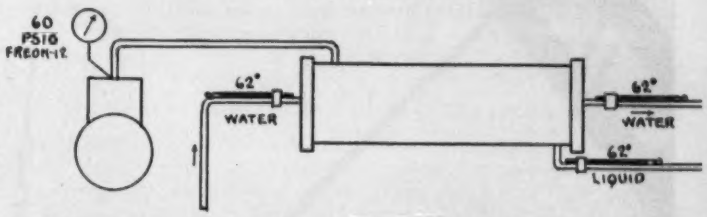
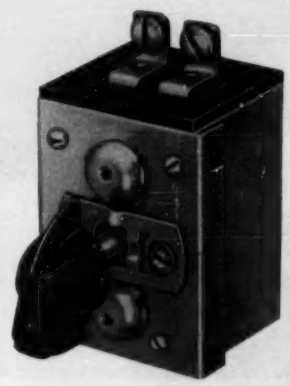


FIG. 6—Check for non-condensables in water-cooled condenser. None indicated.

NEW WILCOLATOR TYPE G1

thermostat

HELPS YOU DESIGN
MORE COMPACT
HEATING CONTROLS



SINGLE-POLE, REMOTE-BULB UNIT COMBINES SMALL SIZE, HIGH CAPACITY, LOW COST

Photo courtesy Electromode Division of Commercial Controls Corporation

Combination of small size and high capacity offered by new Wilcolator G1 Thermostat is used to advantage in compact control panel of Electromode baseboard heater.

Because of its improved-design, snap-action switch mechanism, the new Wilcolator Type G1 Thermostat provides significantly higher contact ratings than were previously available in such a compact unit (2¾ x 1⅝ x 1⅞ in.). Thus you can utilize this new thermostat to design smaller, more efficient control panel assemblies for space heaters, ranges and similar appliances. At the same time, you can also reduce costs, because the G1 is generally priced lower than its bulkier counterparts.

The Wilcolator G1 Thermostat gives you accurate temperature control of practically any electrically heated medium—liquid, solid or gas—from 0 to 585°F. Its contacts are vibration proof and will not cause radio or TV interference. Temperature differential is adjustable and can be factory set to your specifications. Switch mechanism includes positive Off position.

For further information, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N.J. *In Canada:* Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont. *Export:* Wilcolator, 1010 Schaff Bldg., 1505 Race St., Philadelphia 2, Pa.

SPECIFICATIONS

Temperature ranges: 0°F min.; 585°F max. Special temperature ranges: to customer's requirements

Contact rating: 30 amp, 125 and 250 volts a-c noninductive load

Standard shaft: ¼ in. diam. flatted to .156 in. Length to customer's requirements. Special shafts available

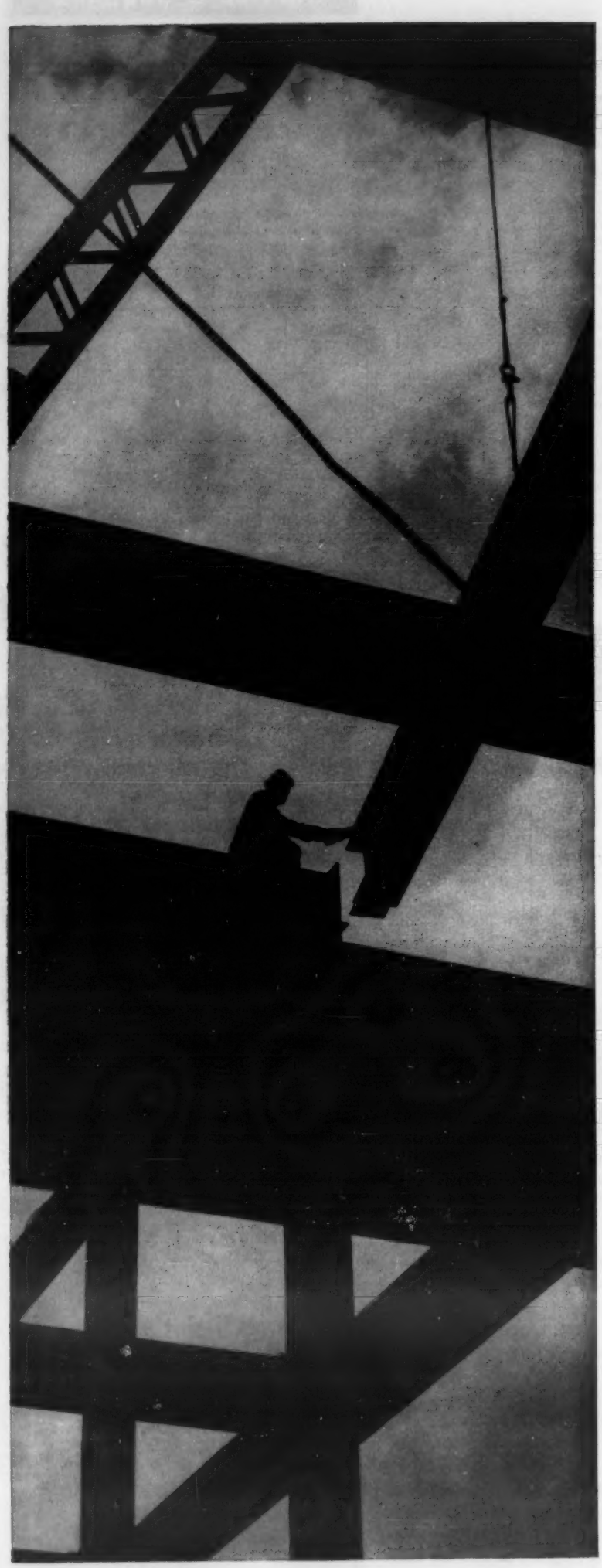
Dials: Standard or special dials, pointers, and chrome bezels available

Terminals: Screw type, AMP or Arkles

THE Wilcolator COMPANY

MANUFACTURERS OF LIQUID EXPANSION ELECTRIC THERMOSTATS FOR:
ELECTRIC RANGES • ROOM COOLERS • AIR CONDITIONERS • CLOTHES DRYERS • SPACE HEATERS • ROLL WARMERS • ROASTERS • FRYERS • STEAM TABLES • WARMING OVENS • RANGETTE OVENS • WATER HEATERS • BAKE OVENS, ETC. • STOCK WATER HEATERS • RESTAURANT APPLIANCES • VENDING EQUIPMENT • PACKAGING MACHINERY • PHOTO DRYERS • BLUEPRINT MACHINERY, ETC.

ALL WILCOLATOR THERMOSTATS ARE UL AND CSA APPROVED AND LISTED



Air conditioning equipment* for large buildings is bought and installed by readers of the NEWS

WHO SPECIFIES OR BUYS?

Engineers who are employed by all four of the most important factors: (1) large air conditioning contractors, (2) consulting engineers and architects, (3) large buildings and factories, and (4) the OEM manufacturer—any one or all can affect the sale of your product if it is to be installed in a large building. As consulting engineers will tell you and as you know, there are very few "closed specifications." The vast majority is "or equal" or "open end"—by type but not by brand name. Therefore, to get the most effective sales results, you want to influence more than just one engineering group. You should sell all the buying factors. AIR CONDITIONING, HEATING & REFRIGERATION NEWS can do this job most effectively.

HOW MUCH WILL THEY BUY?

Estimates indicate a total volume of ten billion dollars over the next ten years. Aside from new construction, the saturation of air conditioning installations in offices is less than five per cent, and in factories—less than one per cent. New applications and installation possibilities are increasing faster than air conditioning is being sold.

*WHAT PRODUCTS DO THEY BUY?

In addition to air conditioning units and their usual accessories, such as condensers, cooling towers, coils, refrigerants, and motors, engineered air conditioning systems for large buildings, factories, etc. require such items as *ducts and duct materials . . . controls . . . piping . . . insulation . . . air moving equipment . . . air cleaning and washing systems . . . pumps . . . diffusers and grilles . . . boilers . . . heat exchangers . . . furnaces . . . dehumidifiers . . . humidifiers . . . vibration eliminators.*

WHAT DO THEY READ?

Just as you depend upon your newspaper for the latest news and information, so do these contractors and engineers turn to AIR CONDITIONING, HEATING & REFRIGERATION NEWS for the timely facts and information concerning their job, their industry. (And it has a 32-year history of dependable accuracy.)

Every Monday morning they pick it up—and start reading! There is no other complete news source available to them and, once read by the subscriber, it is passed along to others in the company (on the average of more than four). The NEWS contains the latest news stories on installations, products, and ideas every week—the kind of information contractors and engineers need. You see the NEWS nearly everywhere you go in the air conditioning field.

In 1958, advertisers of air conditioning units and components for engineered systems used more than twice the volume of advertising in the NEWS as in any other industrial publication. Contact your local NEWS representative or write for more facts on how the amazing advertising power of the NEWS can help you get a bigger share of the large building market.

AIR CONDITIONING
HEATING & REFRIGERATION
NEWS

The Weekly Newspaper of the Industry

RESIDENTIAL — COMMERCIAL — INDUSTRIAL

The leading air conditioning publication with highest paid circulation in the field.

450 WEST FORT STREET
DETROIT 26, MICHIGAN

- **NEW YORK,** 521 FIFTH AVE., MURRAY HILL 2-1928-9, ROBERT M. PRICE.
- **CHICAGO,** 134 S. LA SALLE ST., FRANKLIN 2-8093, REX SMITH.
- **LOS ANGELES,** 4710 CRENSHAW BLVD., AXMINSTER 2-9501, JUSTIN HANNON.
- **DETROIT,** 450 W. FORT ST., WOODWARD 2-0924, AL SCHILDHAMMER.

Electric Heating Goal--

(Concluded from Page 1, Col. 4)

residential revenue increased only 5.5% during the year. Our revenue from non-heating residential customers increased only 4.6%—but our revenue from heating customers increased a solid 43.1%.

"Total residential revenue increased $5,400,000 and of this, more than $1,000,000 came from the heating group. Stated another way, our heating customers, who are only about 1% of the total customers, accounted for 20%—$1 of each $5—of the increase in residential revenue last year."

Emler said another reason for promoting electric heating "is its balancing effect on the summer-winter and the day-night load pattern. . . .

"There can be no question about the value of electric heating in offsetting summertime load peaks resulting from air conditioning. Neither is there any question about the growing acceptance of air conditioning even in the northern section of the country.

"A recent survey of representative electric utility companies indicates 41% of these companies experienced a summer peak in 1958. This is an increase from 30% in 1957. Even 17% of the utilities surveyed in the northeast section of the country had summer peaks.

"Another interesting fact is that 60% of all utilities surveyed reported that summer loads are growing faster than winter loads.

"Electric heating also improves the daily load factor during the heating season. Most studies indicate that the maximum heating demand occurs between 7 and 8 a.m., which is earlier than the time of peak load for either those utilities with morning peaks or those with evening peaks.

"The same studies also indicate that most of the heating kilowatthours are used during off-peak hours."

Rate Problems

Turning to rate problems, Emler told his audience: "There is no pat answer to the question, 'What is a proper rate for electric heating?' Each company must be influenced by its own circumstances and thus 'proper rate' becomes a local problem.

"First of these varying local circumstances is local climate and its effect not only on the number of kilowatthours needed for heating, but also its effect on the shape of the heating load curve and heating load factor.

"A second important local influence is the characteristics of existing electric business. Is there now or is there likely to be a summertime peak? Is the existing peak a daytime or nighttime peak? What is the balance between residential and commercial-industrial load?

"What does it cost to produce and deliver a kilowatthour? Consider both average and incremental costs. What is the form of existing electric rates? Are there demand charges? Is there a floating block for water heating or other major uses?

How Effective Is Competition?

"A third local factor is competition for the heating and appliance business. What does it cost to heat with gas and oil? How effective is the competition for major appliances in the home?

"Each of these factors . . . influences the setting of a rate for electric heating. What is proper—compensatory and competitive—for one company may not be good for another.

"Nor does it seem to me that any utility can afford to stay out of the electric heating business or adopt a too high rate which can't get the heating business, just because some other companies have adopted similar policies."

Emler then made some general observations "about the electric heating rates of a number of the companies which are most successful with promotion.

"First—the heating rate is less than 2 cents per kilowatthour in most cases.

"Second—the heating rate is established as either a trailing block in the residential rate, a special floating block, or by separate metering. In some cases it is a seasonal rate.

"Third—the swing seems to be away from extra demand charges for residential electric heating. Only about one company in seven makes these charges."

A Look at Where We Stand Today

Taking a look at "where we stand today," the speaker stated:

"One survey indicates that at the end of 1956 there were about 300,000 electrically heated homes in this country. This figure increased to about 375,000 in 1957 and reached more than 500,000 at the end of 1958.

"More than half a million of our customers are now familiar with the advantages of electric heating because they are using either heat pumps or resistance heating. Although the majority of them are in the South and West, homes are being heated electrically in all parts of the country."

Emler proposed that "we set as our objective a 25% saturation of electric heating customers at the end of the next 20 years. Our industry should have about 75 million residential customers in 1979, and 20 million of them can be electric heating customers."

Continuing, he told the sales executives: "About 30 million new homes will be built in the next 20 years. Let's heat at least 50% of them electrically.

"Selling 50% of the new homes electric heating isn't an impossible job. Some of you in the South and West are already doing that well or better.

One Midwest Utility Selling 20% of New Homes

"One of our system companies in Indiana and Michigan was able to sell electric heating for 20% of the new homes built last year in its service area, and our company in Tennessee had a record of about 90%. And we are only getting started. An industry-wide average of 50% of the new homes for the next 20 years can be reached, and that will give us 15 million of our 20-million goal.

"The remaining 5 million can come from conversion jobs—installing electric heating in existing homes. 21% of the electric heating installations made in the AEP area last year were these conversion installations.

"This percentage has been increasing each year and we expect to reach a point where almost as many additional electric heating installations will be from modernization of existing homes as from new homes."

Emler then listed several areas of market development "that need the careful attention of the electric utilities." One of these, he said, is dealer development.

"The electric heating dealer," he pointed out, "is often young, small but growing, and he needs our help. He can't afford much sales promotion expense. The electric utility can provide dealer aids. These may be in the form of cooperative advertising allowances, incentive plans for dealer-salesman, open-house assistance, and use-the-user prospect plans."

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

G-E Air Conditioning Dept. Plans--

(Concluded from Page 1, Col. 2)

still being produced at the company's Trenton, N. J. plant. Also under way is the second semester of the "Customer Satisfaction Schools," which the General Electric Air Conditioning Dept. has been conducting for dealers enrolled throughout the nation. This program is aimed at improving installation and service methods, and promotion of better customer services.

Following the closing of the Bloomfield plant operations, Ramsdell announced that complete factory parts, stocks, and repair service facilities will be maintained for prompt life time servicing of the larger packaged commercial equipment produced at the Bloomfield plant. All service facilities will be administered from the central air conditioning department's headquarters at the Tyler plant.

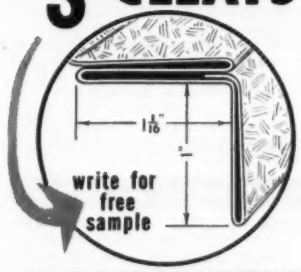
Supply Wholesalers Jan. Sales Show Gain Over '58

WASHINGTON, D. C.—Sales of air conditioning and commercial refrigeration equipment distributors in January were up 2% compared with the same month of 1958 but down 16% from the previous month, according to a report by the Bureau of the Census.

Their inventories at the end of January increased 7% from a year earlier and were up 1% from a month earlier.

The Census Bureau report also indicated that January sales of plumbing and heating supplies distributors were unchanged from January '58.

erect ductwork easily with
STANDING "S" CLEATS



PRICE PER 100 FEET—F.O.B. SPRINGFIELD, MO.

GUAGE	100-999 FT.	1000-4999 FT	5000 FT OR MORE	EST. WT/FT
26	$7.30	$6.20	$5.90	.453
24	8.80	7.90	7.40	.578
22	10.50	9.00	8.50	.703

GALVANIZED – 10 FT. LENGTHS ONLY

PM
PAUL MUELLER COMPANY
P.O. BOX 150 – SPRINGFIELD, MISSOURI

DOES YOUR APPLIANCE CARRY THIS
SEAL of QUALITY?

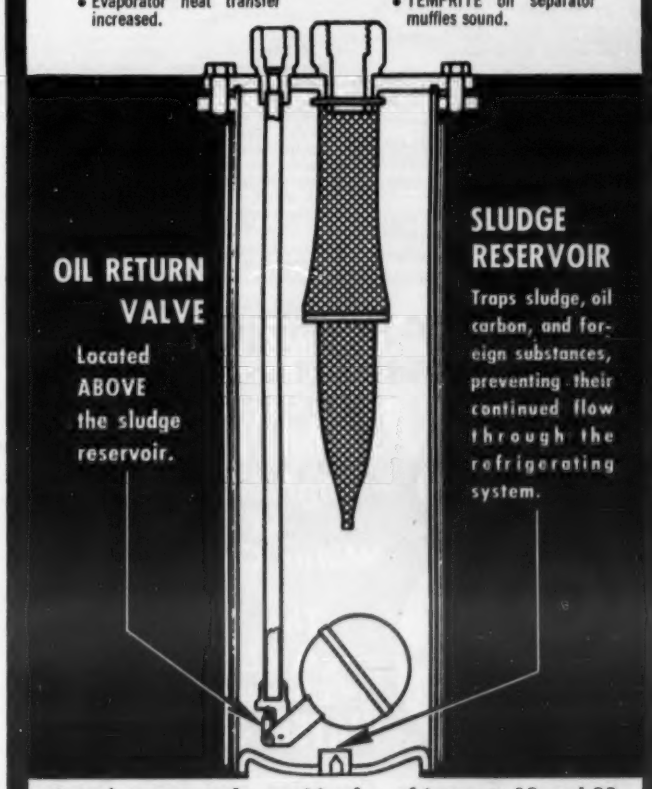
☆
The motor used in this equipment is protected against overloads, low voltage, over-voltage with a Mighty Mite Thermal Protector
☆

MECHANICAL INDUSTRIES PRODUCTION COMPANY
223 Ash Street • Akron, Ohio

Boost Refrigerating Efficiency and Muffle Sound with a
TEMPRITE OIL SEPARATOR

Oil is separated from the gas before it can get into the evaporator and is returned to the compressor automatically . . .

- Full capacity of expansion valve assured.
- Evaporator heat transfer increased.
- Constant clean oil lengthens compressor life.
- TEMPRITE oil separator muffles sound.


OIL RETURN VALVE
Located ABOVE the sludge reservoir.
SLUDGE RESERVOIR
Traps sludge, oil carbon, and foreign substances, preventing their continued flow through the refrigerating system.

Complete range of capacities for refrigerants 12 and 22.

Listed by U. L. and A. S. M. E. (ASME)

8 PAGE BOOKLET
ON REQUEST — Describes many advantages of Temprite Oil Separators.

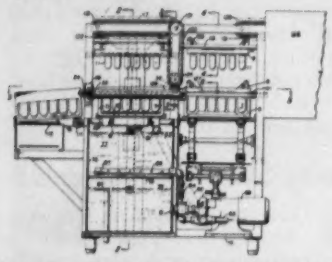
TEMPRITE The Quality Line

TEMPRITE PRODUCTS CORPORATION
Box 72-A, East Maple Road • Birmingham, Michigan
☐ Send me Oil Separator Booklet No. T-447
Name
Address
City Zone State

PATENTS

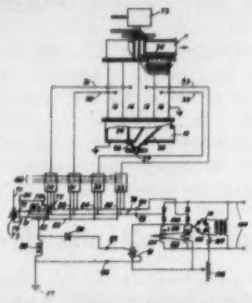
Weeks of Dec. 2 & 9 (Continued)

2,863,403. AUTOMATIC DEFROSTER. Marlin B. Rasmusson, Sacramento, Calif.



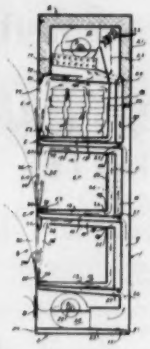
1. An automatic defroster comprising a frame, an elevator platform, means on said frame for moving said elevator platform between a central position and a lower position below said central position, means on said frame for moving said elevator platform between said central position and an upper position above said central position, means on said frame for advancing a combined mold and stick holder onto said platform in said central position, means for retaining said mold on said platform against vertical dislodgement. . . .

2,863,523. ELECTROSTATIC PRECIPITATOR. Hans Klemperer, Belmont, Mass., assignor to APRA Precipitator Corp., N. Y.



1. In an electrostatic precipitator; energy storage means responsive to transient voltage fluctuations in the precipitator produced by flashovers therein; means associated with said energy storage means for dissipating the energy stored therein at a predetermined rate; and means responsive to the residual energy stored in said energy storage means for controlling the operation of said precipitator.

2,862,369. AIR CONDITIONED DISPLAY COMPARTMENT AND METHOD. Edward W. Simons, San Francisco, Calif.

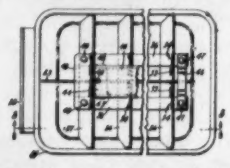


14. In an air conditioned, upright display case having a rear side wall, opposed end walls and top and bottom walls and an open front side opposite said rear wall, a pair of air circulating means, three air chambers formed adjacent said rear wall, the first and second of said chambers respectively communicating with the input and output sides of one of said pair of circulating means and the third said chamber communicating with the output side of the other of said circulating means the input side of which communicates with the atmosphere. . . .

2,862,370. FREEZING DEVICE. Arthur J. Frei, Sr., Dayton, Ohio, assignor to General Motors Corp., Detroit.

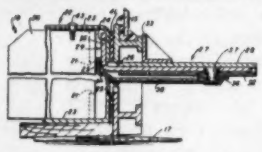
1. A freezing device comprising in combination, a tray, a unitary grid structure in said tray dividing the interior thereof into ice block compartments and removable therefrom as a unit, said grid structure including a one piece longitudinal partition and a

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.



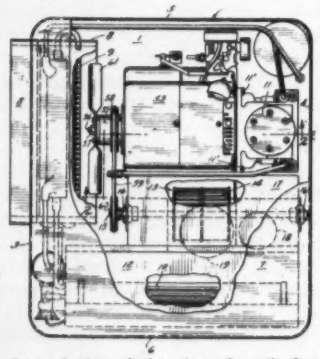
plurality of spaced apart substantially inflexible walls movably secured to said one piece partition and extending transversely thereacross. . . .

2,862,435. DEVICE FOR MOUNTING AIR CONDITIONING UNIT IN A CASEMENT WINDOW. Leroy Buchenberger, Evansville, and Joseph R. Hornback, Hatfield, Ind., assignors, by mesne assignments, to Whirlpool Corp.



1. A mounting structure for supporting an air conditioning unit having an opening in one wall thereof in a window frame structure having a sash portion from which panes of glass have been removed to provide openings for air communication between the unit's wall opening and the outside atmosphere, comprising: an adapter frame having an inwardly directed continuously extending flange whose marginal edge delimits an opening that substantially coincides and registers with the overall area of the openings in the window sash when said adapter is positioned in close association therewith. . . .

2,862,652. AIR CONDITIONER CONSTRUCTION FOR AUTOMOTIVE VEHICLES. James C. Holby and Robert L. Westrum, Minneapolis, Minn., assignors to D. W. Ovan & Sons, Inc., Minneapolis, Minn.



In a device of the class described, a motor including a drive shaft and a block having spaced bearings in opposed walls thereof journalling the drive shaft for rotation therein, a fluid pump including a casing defining a cylindrical chamber and a crankcase, a piston mounted for reciprocatory movements in said cylindrical chamber and a piston rod carried by the piston and extending therefrom into the crankcase. . . .

(To Be Continued)

Project Engineers

Due to expansion we are adding an Air Conditioning Engineer, and a Freezer or Refrigerator Cabinet Engineer.

Positions cover all phases of design from conception to production. Two years minimum experience in related field desirable.

You'll like Amana — good working conditions, many employee benefits. Excellent housing and good living conditions in nearby Cedar Rapids and Iowa City.

All replies held in strictest confidence. Send complete resume and recent photograph to:

W. A. Giddings
Chief Engineer
Amana Refrigeration, Inc.
Amana, Iowa

Lowest Cost — Highest Efficiency in Water Conditioning

The **KARLSON** *Automatic* **WATER CONDITIONER**

Eliminates Clogging, Corrosion and Scale Deposits in Pipes and Equipment

Here is the simplest and lowest cost method of eliminating all those harmful and damaging elements that cause corrosion and clogging of pipes and equipment, in ice cubers, cooling towers, evaporative condensers, coffee makers, urns, etc.

- Does not raise or lower pH in water.
- Prevents the precipitation of calcium and magnesium salts in water by forming soluble complexes with these elements.
- The calcium and magnesium ions in water are held so firmly in a soluble chemical combination that they will not react with any greases or oils.
- It also forms inert complexes with certain metallic ions in water such as; iron, copper, nickel, manganese and zinc.
- Harmless to all metals, prevents corrosion and pitting of metals in zeolite soft water.
- Reduces surface tension as a wetting agent.
- Harmless to septic tanks. No organic sludge build-up—no odors.
- Easy to install—only infrequent replacement of cartridge is required.

Request full information immediately.

(A few exclusive territories still open)

STILES-KARLSONITE CORPORATION

1558 Grand Avenue, Waukegan, Illinois

WATER CONDITIONING COMPOUNDS AND EQUIPMENT

FIELD SERVICE REPRESENTATIVE

Family man preferred. Age 25-35. Willing to relocate and travel. Minimum qualifications 6 years commercial refrigeration experience and educational background. Excellent working conditions and employee benefits.

Send complete resume:

Personnel Department
TYLER REFRIGERATION CORPORATION
NILES, MICHIGAN

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications $10.00 per insertion. Limit 50 words. 20¢ per word over 50.

POSITIONS WANTED

A GRADUATE of the Air Conditioning Training Co., Inc. of Youngstown, Ohio wishes to get into air conditioning or refrigeration. 35 years of age, good health, married. Can furnish good character references. Available immediately. Will consider moving anywhere. P. O. BOX 435, Fritch, Texas.

RESPONSIBLE PERSON 40 years old with 18 years' experience in all phases of air conditioning, heating and refrigeration would like to relocate, preferably with aggressive distributing or wholesale operation. Last eight years have been in management capacity. Wide acquaintance with industry personnel. Reference furnished upon request. BOX A6223, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEER—Mechanical engineering degree plus post graduate work in salesmanship and sales management. Three years' experience as representative selling commercial air conditioning and refrigeration equipment in Eastern Pennsylvania and Southern New Jersey. Desires lines in same area. BOX A6224, Air Conditioning, Heating & Refrigeration News.

YOUNG MAN with 20 years' extensive experience engineering, selling and servicing commercial refrigeration, air conditioning and food service equipment. Considerable investment available for sound business proposition. Will relocate immediately. Please give details in first letter. BOX A6231, Air Conditioning, Heating & Refrigeration News.

SALES EXECUTIVE — Seeks position as general sales manager. Regional or district manager with manufacturer of air conditioning, heating or refrigeration equipment. More than 20 years' experience in sales and engineering mgt. with major manufacturer. Capabilities cover all phases of wholesale and retail distribution. Development and execution of sales programs and policies selection and training of sales personnel. Familiar with all trading areas. Can furnish excellent references. BOX A6232, Air Conditioning, Heating & Refrigeration News.

POSITIONS AVAILABLE

ENGINEER REFRIGERATION Controls—To head a department on design and development of commercial refrigeration control valves of all types; national corporation with midwestern manufacturing and engineering facility; salary and bonus commensurate with work background and ability. Send full details, qualifications and personal data, to BOX A6172, Air Conditioning, Heating & Refrigeration News.

WANTED, SALES representatives. Calling on users of copper refrigeration tubing. Excellent opportunity offered by leading importer. Tubing made in strict accordance with ASTM specifications. In reply state age, experience, lines now carried, to BOX A6216, Air Conditioning, Heating & Refrigeration News.

AIR CONDITIONING product engineer —Leading manufacturer of air conditioning and refrigeration equipment has opening for project design engineer in newly established engineering section on heat pump and residential package air conditioners. Desire graduate engineer with at least 2 years' design experience on residential air conditioners and refrigeration products. All replies held in strict confidence. Send short resume to BOX A6217, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEERS — manufacturer's representative covering N. Y. trade area OEM, wholesale, and major contractors in refrigeration and air conditioning industry has opening in N. Y. metropolitan area. Schedule of remuneration attractive only to financially secure or semi-retired successful persons who get satisfaction from challenging sales tasks. BOX A6218, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEER, graduate preferred, selling to original equipment manufacturers refrigeration components and accessories. Must have experience in design engineering, refrigerating systems. Must possess sales ability. Relocation not necessary. Please include resume with reply. BOX A6219, Air Conditioning, Heating & Refrigeration News.

BUYER—MAJOR appliances. National retail-wholesale merchandising chain has immediate opening for major appliance buyer. Must have extensive experience buying and merchandising refrigerators, freezers, air conditioning equipment or laundry equipment. Background in engineering or product design helpful but not essential. Age 32-38. Starting salary $12,000 bracket, with excellent advancement opportunities. Profit sharing, retirement program and many other employee benefits. Send resume and salary requirements to BOX A6225, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION PROJECT engineer —with at least 2 years' experience in refrigeration product design including laboratory testing, drafting and preparation of manuals. Must be a self starter with the necessary drive to carry a project through from inception to production. This is a ground floor opportunity with a fast growing manufacturer of complete systems for various mobile and portable applications. Located in the South. It is a wonderful climate in which to live and work. Send complete resume, including recent photo and salary desired. BOX A6226, Air Conditioning, Heating & Refrigeration News.

MANUFACTURER'S REPRESENTATIVES—Manufacturer with over 50 years of service to O.E.M. accounts requires additional representation to promote sale of axial flow propellers in New York, Pennsylvania, New Jersey and New England, to manufacturers of air conditioning equipment, heating equipment, fans, etc. Essential that sufficient man-power and coverage be available to blanket the area in which you operate. In reply, outline area covered, give resume on background and experience of all personnel, including owner, expected rate of commission, lines presently representing and accounts with which you have close and friendly relationships. BOX A6227, Air Conditioning, Heating & Refrigeration News.

DESIGN ENGINEER—With degree in mechanical, electrical or industrial design and minimum of one year shop or design experience. Drafting ability required. For design section of largest commercial refrigerator manufacturer in South. Send qualification details, transcript, personal data and salary requirements to BOX A6230, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION ENGINEER—With degree and minimum of one year experience in commercial refrigeration industry. For test and development section of largest commercial refrigerator manufacturer in South. Send full detail of qualifications, transcript, personal data and salary requirements to BOX A6229, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT WANTED

WANTED—WATER cooler and window A. C. parts and service franchise. Now operating heating and air conditioning service. Investigation welcome. Write DART HEATING AND A. C., 17833 Strasburg, Detroit 5, Mich.

2, 3, & 5 ton water cooled residential blower type and commercial air conditioners. By volume wholesalers purchaser. BOX A6228, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT FOR SALE

RESIDENTIAL & COMMERCIAL air conditioners—air cooled 1 ph.—230V. 2 hp. highside with horiz. evap. $357.00; 3 hp.—$489.00; 4 hp.—$684.00; 5 hp.—$761.00. 2 hp. self contained horiz. units $306.00; 3 hp.—$504.00; 4 hp.—$599.00. Additional 5% discount for quantities of 5 units one order to one destination. ARCTICAIRE MFG. CO., 2201 Grand—K. C., Mo., Telephone BA 1-7055.

SURPLUS 100 ¼ h.p. sealed units complete 115 volts 60 cycle $37.50 ea. Lots of 10—$35.00. Units are now equipped with tube coils or blower coils 1500 B.T.U. at 10°. Can be shipped with coils at $45.00 each F.O.B. Detroit. CHAMPINE REFRIGERATION SUPPLIES, 451 East Milwaukee, Detroit 2, Michigan. Trinity 3-1160.

MISCELLANEOUS

WAREHOUSE—LOW rates—Central Connecticut receiving, shipping and invoicing service via rail or truck. Sales rep. available. THE FRANKLIN TERMINAL CORP., c/o The Rackliffe Co.'s, New Britain, Connecticut. BA 9-1691.

CONTROLS & RELAYS repaired like new. UNITED CONTROL REPAIR COMPANY, new address: 151 E. 126th Street, New York 35, New York.

ATTENTION REFRIGERATION Servicemen: Would you be interested in saving from 25 to 50% on many standard refrigeration and air conditioning parts and supplies? Send for our free circulars and catalogs. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

Dallas 'Watchdog' Program--

(Concluded from page 1)

under the conditions prescribed by the association.

ACRA did some promoting of its program last year through advertising in builders' and community publications, displaying its seal or symbol and a list of members, and using copy which stated:

"This association, through its educational clinics and job inspections, is dedicated to the improvement of the engineering, installation, performance, and service of the air conditioning systems installed by its members."

In the "watchdog committee" program, ACRA judges installations against the association's own standards for safety and quality, which Executive Secretary Col. John A. Smith, Jr. says are well above and beyond those required by the Dallas city code. (Text of the standards are published at the conclusion of this story).

A three-man committee inspects at least 10 jobs per month being done or completed by the members. Membership of the committee is changed every month.

The committee is also authorized to make inspections of complaints to the secretary by members, reports by city building inspectors of jobs that are "questionable" even though they comply with the technical provisions of the city code, jobs culled from building permits, and such other jobs as the committee members may see fit to inspect.

Following are the Dallas Air Conditioning & Refrigeration Contractors Association Standards:

ASSOCIATION STANDARDS

Dallas Air Conditioning & Refrigeration Association

The following standards have been adopted as a guide for members of this association. They are considered worthy of strict compliance by the membership.

1. A contract with a purchaser should state temperature guaranteed and conditions therefor.
2. A contract should embody a Mechanics Lein.
3. The contract should state the amount of free service guaranteed to the purchaser.
4. All contracting members must have liability and workmen's compensation insurance.
5. A copy of the manufacturer's warranty must be left with the owner or on the installed equipment.
6. All equipment installed within the confines of a building foundation must be mounted on a vibrator insulator of other than Celotex type board.
7. Unions for other than copper lines will be installed on each side of each major piece of equipment.
8. Where two or more units are in parallel, valves will be placed so that either machine may be shut off while the other or others operate.
9. All supply registers should have adjustable pivoted front bars and should be sized according to the manufacturer's recommendations.
10. All refrigerant piping will be sized according to condensing unit manufacturer's recommendations. Type "L" copper, or heavier, should be used.
11. All solder joints should be made with 95-5 solder, or harder.
12. All remote condensing unit installations will incorporate a liquid line sight glass and drier-strainer, except where factory charged refrigerant lines are furnished by the unit manufacturer who makes no provision for a sight glass or drier-strainer.
13. Where liquid line and suction line are insulated together, or tied together in any way, they will be soldered to prevent rubbing.
14. All suction lines which are run exposed, or are placed where condensation damage might result, will be insulated with a molded type pipe covering.
15. All attic installations will have a condensate drain run to the sewer or other acceptable location. In addition, all evaporators located in the attic, except those mounted immediately above a closet-type furnace, will have an emergency drain pan constructed of not lighter than 24 gauge galvanized metal with solid or soldered corners and a separate drain emerging from the eave of the house, or in some conspicuous place.
16. No drain will be run in pipe smaller than ¾-in. and will not be tapped.
17. All electrical conduit run under ground will be rigid.
18. Every 3-phase motor will be equipped with its own starter with proper overload protection.
19. All motors exposed to weather will be covered with aluminum or galvanized weatherproof cover.
20. All central type refrigeration machines, remote and self contained, will have a low and high pressure cut-out.
21. All installations will be made so that all parts are accessable for service or replacement without the removal of any other piece of equipment.
22. All installations, both heating and/or cooling, will be equipped with filters ahead of fans or coils and will be easily accessable.
23. The name, address, day and night phone number of the contractor who makes the installation will be prominently displayed in the equipment room.
24. In the case of bidding or figuring on the air-cooled system, the proposal will state B.t.u. capacity at 105° outdoor temperature.
25. All cooling towers will be equipped with provisions for bleeding.
26. All cooling towers will have serviceable drains.
27. All towers must be set on concrete pads or piers, if installed on the ground.
28. All cooling tower fan motors will be covered with a weatherproof cover.

* * *

STANDARDS FOR MEMBERSHIP

Dallas Air Conditioning & Refrigeration Association

Any candidate for membership before his name is presented to the membership committee should have the following minimum qualifications:

1. Must have a business phone.
2. Must have a place of business in a location zoned commercial.
3. Should have been in business for at least one year, so his performance can be judged.
4. If requested, should be willing to present a financial statement to the membership committee.
5. Should have adequate shop facilities for executing air conditioning installations.
6. Should maintain qualified service personnel within his organization.
7. Must have adequate engineering skill to properly handle air conditioning installations.
8. Must upon request, furnish certificates of insurance covering workmen's compensation and employers liability, as well as comprehensive liability policy covering property damage and bodily injury.

Alabama Contractors To Convene June 25-27

BIRMINGHAM, Ala. — The Roofing, Sheet Metal, Heating & Air Conditioning Contractors' Association of Alabama will hold its annual convention at the Battle House hotel in Mobile June 25-27.

Defendants Given 20 Days To Answer Cory Complaint

CHICAGO—Denying the motion of Bernard A. Mitchell and other former stockholders of Mitchell Mfg. Co. to dismiss the suit filed against them by Cory Corp., Superior Court Judge John A. Sbarbaro directed defendants to answer the complaint within 20 days, it has been announced.

Hearing on issues formed by the pleadings was set for June 1.

The Cory suit charges misrepresentation and concealment as to assets and liabilities at the date it purchased all of Michell's outstanding capital stock.

S & R Soda Fountain Announces Merger

NEW YORK CITY — Merger of S. & R. Soda Fountain Mfg. Co., Inc. and Central Restaurant Equipment Co., both of New York City, has been announced by Bernard Roberts, S. & R. president.

Roberts said he would announce, at a later date, the officers of the new company, to be known as S. & R. Food Service, Inc.

"By combining our forces," he pointed out, "we can offer our customers our experience in all problems necessitating special work, from the small unit or snack bar sections in luncheonette equipment to the largest of heavy-duty cafeterias and kitchen equipment."

Financially Responsible Leading Manufacturer of HEAT EXCHANGERS in Germany

desires American License or Franchise for the production and sale of similar products in Germany. We offer an opportunity for investment in our present organization, and to interested parties our financial participation toward the establishment of an American subsidiary company to secure a firm foothold in the Common European Market can be considered.

Our years of experience in this industry assures complete cooperation toward the success of such an enterprise. We have expert engineers, skilled workers, a development staff and sales organization to open up the market immediately.

In reply—please give full particulars:

BOX A6222, AIR CONDITIONING, HEATING & REFRIGERATION NEWS

ARE you in need of a "just right" man to fill a slot in your organization—the man you are looking for will be reading the

NEWS' CLASSIFIED ADS

NOW you can stop SCALE, RUST and ALGAE

in water-cooled air conditioning and recirculated-water heating systems *this easy way!*

NOCOR FORMULA 800 with ALGENE

• for commercial, industrial and residential use •

A product of research for the oil industry in corrosion control, NOCOR Formula 800 brings you *six* chemical benefits combined in a *single*, simple to use compound:

1. INSURES ALGACIDAL AND ALGASTATIC CONTROL
2. REMOVES SCALE IN CONDENSERS AND FLOW LINES
3. INHIBITS FORMATION OF NEW SCALE
4. RETARDS RUST AND CORROSION
5. REPLACES COSTLY ACID TREATMENTS
6. MAKES CONTINUOUS BLEED-OFF UNNECESSARY

Economical . . . highly effective! NOCOR Formula 800 has been tested and approved by maintenance engineers and service companies. Find out for yourself how this remarkable formula can help *you* to greater profits. Write today for full details.

Available in ½ and 1 gallon bottles for residential use; 5 and 55 gallon drums for commercial use.

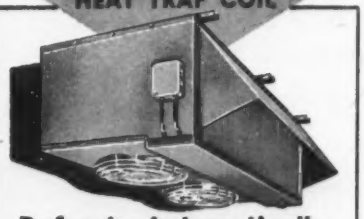
atoz CHEMICALS

2600 MERCANTILE BANK BLDG. DALLAS 1, TEXAS

ATOZ CHEMICALS
2600 Mercantile Bank Bldg., Dallas, Texas
Please send information about NOCOR.
Name & Title .....
Company .....
Address .....
City ..... Zone ..... State .....

WITT Defrostair

Patented Low Temperature HEAT TRAP COIL



Defrosts Automatically

• FOR FREEZING AND STORING FROZEN FOOD AND INDUSTRIAL LOW TEMPERATURE APPLICATIONS

WITT DEFROSTAIR heat trap coil requires only a low cost single pole, double-throw, time clock for complete automatic defrosting. Easy low cost installation. Requires no re-evaporation or special plumbing. Available in 17 models in BTU capacities of from 1,800 to 38,000 at 10° T.D.

For light frost applications and fresh meat refrigerators with temperatures between 28° and 33°F, use the new, inexpensive, highly efficient COR-LECTRIC.

A Few Territories Open

Write for Data Sheet

WITT Coils — A. H. WITT CO., Inc. 940 N. Sycamore Ave. Los Angeles 38, Calif.

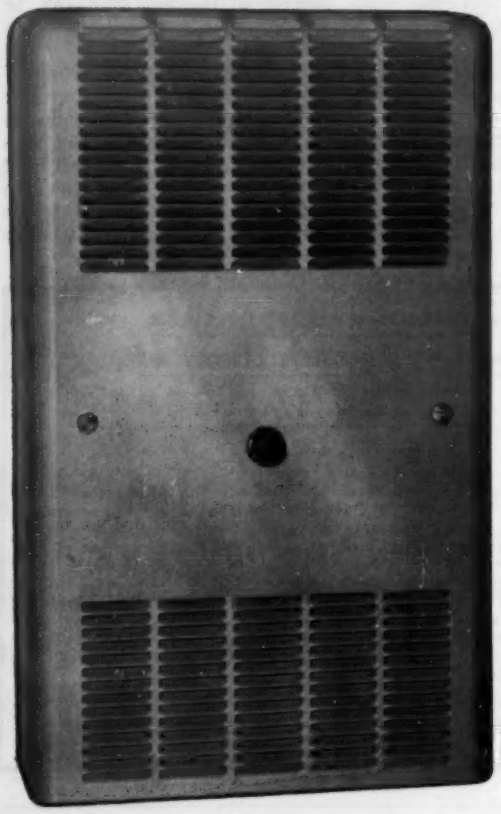
MINERALLAC STEEL Beam Clamps for Mounting Hangers on I-Beams

Mounts Minerallac hangers No. 0 to No. 6 on I-Beams without necessity of drilling holes. Have ¼-20 tapped holes. Fits beam flanges up to ½" thick. Low cost. Send for literature.

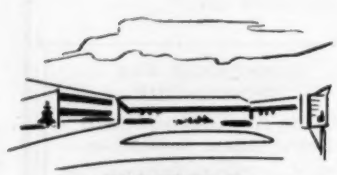
MINERALLAC ELECTRIC COMPANY
25 N. PEORIA ST. • CHICAGO 7, ILL.

KEY TO SMALLER REQUIREMENTS

NEW DUNHAM-BUSH 'CHC'

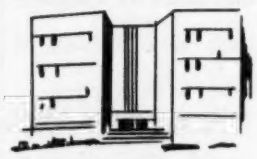


COOLING HEATING CONDITIONER



MOTELS

HOTELS



APARTMENTS

RESIDENCES

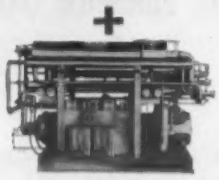
'CHC'

+

CENTRIFUGAL PUMP

+

NOW...



'PC'

OR

'ARPC'

(WHERE WATER USAGE IS LIMITED)

Where there's a need, there's a Dunham-Bush product!

The new "CHC" Cooling-Heating Conditioner continues the Dunham-Bush pattern of product progress providing "one-source-one responsibility" for all your air conditioning, heating, refrigeration and heat transfer needs.

"CHC" is a compact fan coil unit for mounting between-the-studs of a wall structure, designed to meet the smaller space and capacity requirements of motels, hotels, apartments and residences. Together with Heat-X Package Water Chillers, Dunham-Bush Pumps, and Water Savers, all the necessary equipment to meet complete specifications are provided.

Dunham-Bush "CHC" units are available in two basic sizes—Model CHC-150 and CHC-300. The standard unit is basically designed for free standing use readily adaptable for semi-recessed applications. Each standard unit can be wall mounted, fully exposed or semi-recessed, as required for "off the floor" installations. Matching trim pieces are available for finishing purposes on semi-recessed applications.

Other available features include fresh air wall boxes to meet ventilation requirements calling for the introduction of fresh air up to 20% of the rated CFM: rear discharge sections and grilles to permit discharge of up to 50% of the rated CFM to adjacent rooms where the standard unit is installed on a common interior partition.

Keep up-to-date on the latest! Write for complete "CHC" specifications or call your Dunham-Bush sales engineer.

= DUNHAM-BUSH equipment for COMPLETE SPECIFICATIONS

Dunham-Bush, Inc.

WEST HARTFORD 10 • CONNECTICUT • U. S. A.

MICHIGAN CITY, INDIANA • MARSHALLTOWN, IOWA • RIVERSIDE, CALIFORNIA

SUBSIDIARIES

HEAT-X, INC. BREWSTER, N.Y. — THE BRUNNER CO. WEST HARTFORD, CONN. — DUNHAM-BUSH (CANADA), LTD. TORONTO, CANADA — DUNHAM-BUSH, LTD. PORTSMOUTH, ENGLAND — BRUNNER CORPORATION (CANADA) LTD. PORT HOPE, ONTARIO

DUNHAM-BUSH heat-x BRUNNER